

Issue Date	Org. Code
2-5-92	W/OS032

NATIONAL WEATHER SERVICE

Engineering Handbook

Program	Part	Section
EHB-11	03	3.2

MODIFICATION INDEX - AMOS III-70/73

<u>Number</u>	<u>Date of Issue</u>	<u>Title</u>
1	March 29, 1977	Change in Pulse Width of Pulse Generator
2	January 25, 1978	Addition of OR Gate 1A-A to the 1-PG-1 Circuitry of the ASI Module
3	November 19, 1979	Temperature Sensor Aspiration
4	June 11, 1980	Power On Pulses
5	October 28, 1982	Viking Connectors for Dewpoint Probe Cable
6	September 24, 1984	1A2A1 Clock Replacement
7	September 20, 1985	Conversion to RS232C Communications
8	April 19, 1985	AMOS Precipitation Accumulation Module, Reset Elimination
9	December 23, 1985	AMOS Precipitation Accumulation Module, Reset Function Change
10	May 30, 1986	Power-up Restart Correction
11	August 15, 1986	Okidata Microline 182S Printer Installation
12	March 25, 1987	S007-1A2A16A Service P.C.B.
13	September 15, 1988	Replacement Modules S007-1A2A8A (Temperature) and S007-1A2A9 (Dew Point)
	February 2, 1989	Errata Sheet 1 to Modification Note 13: AMOS Change Number Revision



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE

April 22, 1977

W514

TO: All Regional Headquarters, Electronic Program Officers, and
Electronics Technicians

FROM: J.M. St. Clair *J.M. St. Clair*
Chief, Engineering Division

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11
Issuance 77- 2

1. Material Transmitted:

Engineering Handbook No. 11 - Automatic Observing Equipment,
Section 3.1; AMOS III - 73 Equipment Modification No. ~~4~~ 1

2. Summary:

Modification No. 1 changes the pulse width of the Pulse Generator
circuit of the temperature/dewpoint card.

3. Effect on Other Instructions:

None.

EHB-11
Issuance 77- 2



AUTOMATIC OBSERVING EQUIPMENT MODIFICATION No.1
(For Electronics Technicians)

1

SUBJECT : Change in Pulse Width of Pulse Generator

PURPOSE : To Increase Accuracy of Measurement

EQUIPMENT AFFECTED : All AMOS III-73 Temperature/Dewpoint Cards

PARTS REQUIRED : Two 150 PF, 50V Capacitors, Centralab C22A151 K

Note: The required number of capacitors should be ordered by the Electronics Technicians responsible for each installation from CLSC, Kansas City, Missouri on a Stores Requisition as follows:

NSI Kit, AMOS III - 73 Modification No. 1
(Marked AMOS III - 73 MOD 1

TIME REQUIRED : One Man-hour

GENERAL:- This modification of the pulse generator circuit (1-PG-1) on the temperature/dewpoint card, changes the pulse width of the Reset Pulse from 4 microseconds to 0.5 microseconds.

This external triggering pulse to the analog/digital converter (ADC1) will now be at the proper operational specification requirement of the converter. This in effect, makes the overall accuracy of measurement of this circuit more reliable.

PROCEDURE:

Remove capacitors C7 (0.001 mf) and C8 (0.001 mf) from temperature/dewpoint card (1A2A8/1A2A9. Replace these capacitors with 150 PF capacitors at the same C7 and C8 locations.

This completes the modification.

Manual Changes: The following changes should be made.

a) Theory, Page 2-127, Par. 5, change 4 microseconds to 0.5 microseconds.

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- b) Circuit Drawing, Page 2-129, Section I-PG1, change C7 and C8 from 0.001 to 150 PF.
- c) Parts List, Page 2-134, change C7 and C8 parts designator from 0.001 micro-seconds to 150 PF.

The attached "Modification Completion Report" will be duplicated and routed to the NWS Headquarters, Engineering Division (W511) through the appropriate Regional Headquarters, as indicated on the report form.

MODIFICATION COMPLETION REPORT

Modification Title:

Modification No. AMOS III-73 Modification #10

Equipment Code:

Serial No. : _____

Station Name:

Station No.

Reg. _____Area _

Date Completed
(YYMMDD) :

Time to Complete
(Whole Hours) _____

Signature - - Technician Performing Modification

Routing:

Initials:

Date:

1. EPO's

2. Regional Engineering

3. NWS Engineering Division (W511)

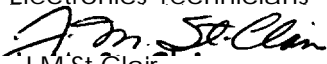
Remarks/Problems Encountered, or Other Pertinent Information:



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

February 27, 1978

W514

TO: All Regional Headquarters, Electronic Program Officers, and
Electronics Technicians
FROM: 
J.M. St. Clair
Chief, Engineering Division

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11,
Issuance 78- 2

1. Material Transmitted:

Engineering Handbook No. 11 - Automatic Observing Equipment Section
3.1; AMOS III-73 Equipment Modification No. 2.

2. Summary:

Modification No. 11 provides EI Techs instructions for modifying the ASI
Module 1A2A12.

3. Effect on Other Instructions:

Pen and ink change to EHB-11, Part 3, Section 3.1: Automatic Observing
Equipment Modification No. 10 is to be changed to Modification No. 1,
and inserted into Section 3.2.

4. All completed modifications shall be reported on the H-28 Engineering
Progress Report, according to EHB-4, Part 2, Pages 2-6 and 15,
Issuance 76-1, revised August 15, 1976.

EHB-11
Issuance 78- 2



AMOS MODIFICATION NOTES
(For Electronics Technicians)

SUBJECT : Addition of OR Gate 1A-A to the 1-PG-1 Circuitry of the ASI Module

PURPOSE : To Prevent an Erroneous ASI Reading that Occurs in the First Message Received after a Power Failure or Power Up Condition

EQUIPMENT AFFECTED : All AMOS

PARTS REQUIRED : 1 Capacitor; .001 mf., 50V, + 10%,
USCC #C22C102K
1 Resistor; 5.1 K ohms, 1/4W, + 5 % carbon
6 Insulated Hook-up Wire .035 Dia.
The above parts are to be purchased locally if not on hand.

TIME REQUIRED : 2 Work-hours

General : When the AMOS Processor Unit is first powered-up or a power failure occurs and service is restored, the first message received will have an erroneous ASI reading. The A-D converter used on the ASI Module does not automatically zero itself until after being interrogated. Hence, the first message received is invalid. This modification provides a double interrogation of the ASI module to remedy the erroneous reading. The modification utilizes an unused gate in the Pulse Generator Circuit 1A-A,

PROCEDURE:

1. Turn off the power to the AMOS Processor Unit and remove the ASI Module 1A2A12. Place the module on a suitable working surface with the component side down.
2. Prepare three jumpers using the .035 diameter hook-up wire,, Cut them approximately 3, 1-1/2, and 1/2 inches in length and tin each end suitable for soldering onto the ASI Module. Insure that the hook-up wire is insulated so no short circuits will occur when it is pressed flat against the circuit board.
3. Locate the Shaper (SP334A), 1-SHP-1, chip 2C, at coordinates C/2.
4. Using the 3" jumper wire, solder one end to the "land run" which connects pin 2 of EHB-11

- 1-SHP-1 and pin 4 of 1-SR-1, (Shift Register, SP3271, chip 2D). Refer to Figure 1, Make certain the jumper is insulated with sleeving.
5. Locate the Pulse Generator (SP384A), 1-PG-1, chip 1A, at coordinates A/1.
6. With an Exacto-type knife cut the "land run" which joins pin 7 of 1-PG-1 to C5 and R14. Make the two cuts as shown in Figure 1. Insure that there is enough land area to solder to on each end of the cut "land run."
7. Solder the other end of the 3" jumper wire employed in Step 4 to the center area of the "land run" cut in Step 6. Press the jumper flat against the circuit board.
8. Using the 1-1/2" jumper wire, solder one end to pin 5 of 1-PG-1 and the other end to the "land run" that connects C5 to R14, Refer to Figure 1. Be sure the jumper is insulated with sleeving and press it flat against the circuit board.
9. Solder the remaining 1/2" jumper wire between pins 3 and 7 of 1-PG-1. Make certain the jumper is insulated with sleeving and press it flat against the circuit board. Refer to Figure 1.
10. Solder the .001 mf. capacitor between the center portion of the "land run," cut in Step 6, and pin 4 of 1-PG-1. Refer to Figure 1, Keep the capacitor leads short with the capacitor close to the circuit board and free of short circuits.
11. Solder one end of the 5.1 K resistor to pin 4 of 1-PG-1 and the other end of the resistor to the "land run" that connects R15 to pin 1 of 1-GAT-17 (SP300A), chip 1 B, at coordinates B/1. Refer to Figure 1. Keep the resistor leads short with the resistor close to the circuit board and free of short circuits.
12. Return the ASI Module to its proper location in the Processor Unit, This completes the modification.

Manual Changes:

1. AMOS Manual No. 11-103 Volume 2:
- a, Page 2-171, make appropriate changes to the schematic by affixing Figure 2 of the attachments to the schematic as shown in Figure 3 of the attachments.
 - b. Page 2-176, insert in the Parts List, the additional capacitor (C16) and the resistor (R-28) of this modification into their proper places.

Attachments: Figure 1
Figure 2
Figure 3

EHB-11
Issuance 78- 2

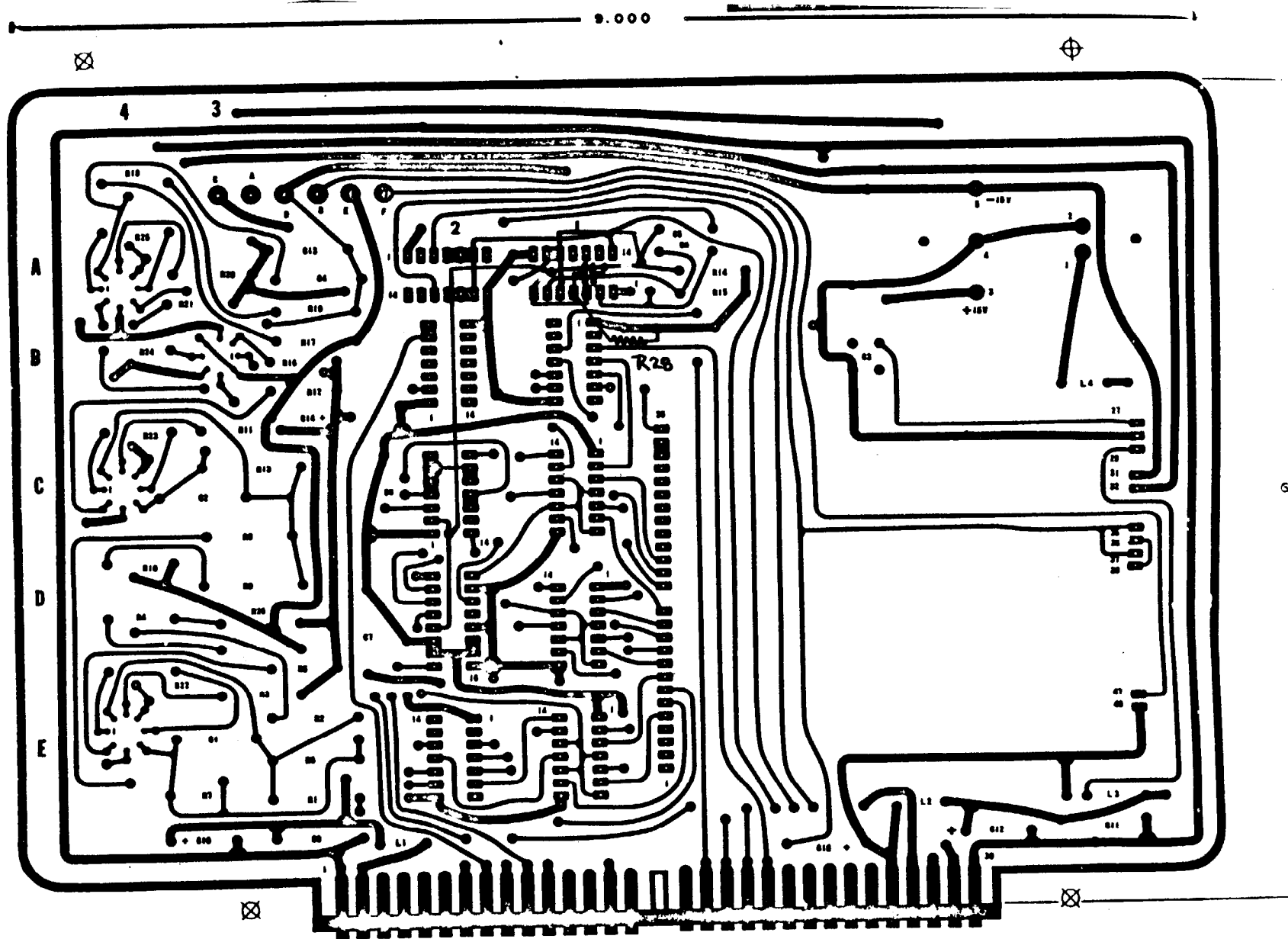


FIGURE 1

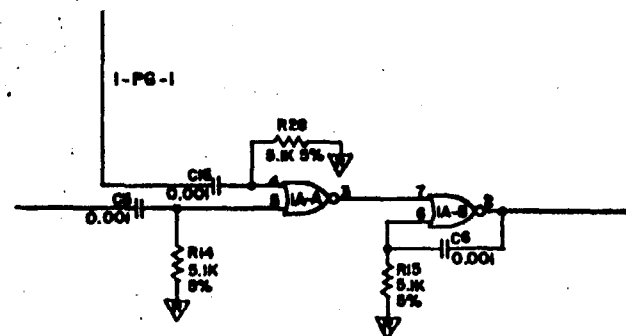


FIGURE 2

1A2A12 ALTIMETER SETTING, S807-1A2A12

② MESSAGE COMPOSER

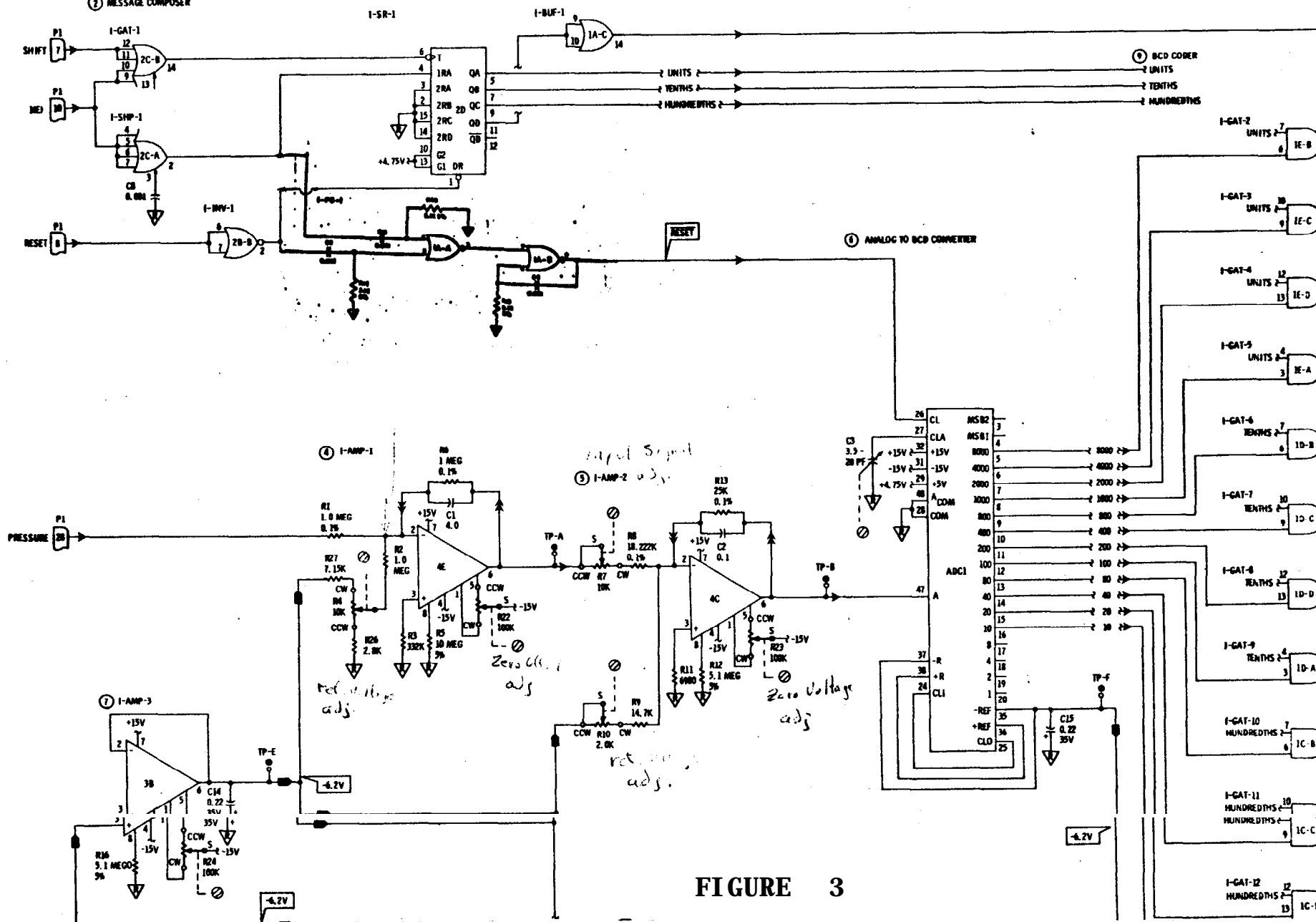


FIGURE 3



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

December 14, 1979

OA/W5141 - JM

TO: All NWS Regional Headquarters, Area Electronics Supervisors,
and Electronics Technicians (EHB-11 Distribution)

FROM: OA/W51 J. M. St. Clair

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11,
Issuance 79-9

1. Material Transmitted:

Engineering Handbook No. 11 - Automatic Observing Equipment,
Section 3.2; AMOS Modification No. 3: Temperature Sensor
Aspiration.

2. Summary:

Modification No. 3 provides Electronics Technicians with instructions for modifying the AMOS Temperature Sensor with an Aspirator.

3. Effect on Other Instructions:

Pen and ink changes to Manual 11-103.

4. Reporting Equipment Modifications:

All completed equipment modifications shall be reported on the H-28 Engineering Progress Report, according to EHB-4, Part 2, Pages 2 and 15, Issuance 76-1, Revised August 15, 1976.

EHB-11
Issuance 79-9



Engineering Division
W514

November 19, 1979

AMOS MODIFICATION No. 3
(For Electronics Technicians)

SUBJECT : Temperature Sensor Aspiration

PURPOSE : To Reduce System Errors and Alter Response Time

EQUIPMENT AFFECTED : All AMOS Temperature Sensors

PARTS REQUIRED :

- 1 - Sensor Plate
- 1 - Baffle Ring
- 1 - Thermal Mass, S010-F3T4
- 1 - Template Set
- 1 - Template Applications, S01-F3T4-DR005
- 1 - Silastic Tube RTV732
- 1 - Fan, Rotron, 3B763ZH
- 1 - Cable, Power, 3 Conductor
- 1 - Capacitor, .5 uf, 100V, 10%
- 1 - Clamp, Cable
- 1 - Screw, Set, Hex, Cres. No. M3x0.5
- 1 - Ring Terminal No. 4801, H>H> Smith
- 3 - Screw, Bind Hd. Cres. No. 4-40x 3/8
- 3 - Washers, Lock No. 4
- 3 - Cleats, Motor Mount, L2-2 PIC Corp.
- 1 - Cutting Snips' No. J-7 Wiss & Sons
- 1 - Metric Wrench (M-3 Hex Hd.)

TIME REQUIRED : 2 Work hours

This modification will be provided upon receipt of NOAA Form 37-4 at W5141. It will be in Kit form and careful attention should be applied to make certain all parts, templates, and tools are on hand before commencing the modification. A pair of cutting snips No. J-7 manufactured by Wiss & Sons will be supplied in the Modification Kit. The snips will be required to cut a hole in the bottom of the inner hat assembly and to enlarge the top hole in this inner hat. The normal complement of Electronics Technicians hand tools will handle the rest of the requirements in the Modification Kit. The metric wrench is not supplied in the kit.

General: During extensive testing at the Sterling Research and Development Center, problems in the Temperature Sensor which are common to the RAMOS, AMOS, and H063 were discovered when the Sensor was compared to an acceptable standard. In an attempt to reduce the number of errors, a modification to aspirate the Temperature Sensor has been devised. A thermal mass is to be added to cover the temperature transducer. This should increase the time constant to about 4 minutes, which is approximately the same constant before this modification.

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PROCEDURE:

1. Unplug the Temperature Connector going to the Temperature Power Supply Unit 2PS2. This will disconnect the temperature sensor. Refer to Figure 5-4 Page 5-13, and Figure 5-12, Page 5-23 in Volume 1 of Manual 11-103.
2. Release the silicone temperature cable from the power supply unit. The PSU has a moisture proof connector around the cable and is potted with RTV. The potting material will have to be removed first in order to facilitate removal of the cable.
3. Remove the bolts holding the temperature sensor to the channel strut. The sensor is now free and ready for modification.
4. Refer to Figure 2-255 in the AMOS Manual 11-103, Volume 2.
5. Remove the three screws holding the Temperature Transducer Housing to the inner hat assembly; also remove the screw that is holding the silicone cable to the inner hat assembly. Discard cable clamp.
6. Carefully lay back the Temperature Housing Assembly. Remove the three screws that secure the inner hat assembly. Now the inner hat assembly is free of the outer hat assembly and the Transducer Housing. Clean inner hat assembly with dusting cloth.
7. Refer to Drawing S010-F3T4-DR005. Adhere the large template required to cut the hole in the bottom of the inner hat assembly in the manner suggested. That is the three crosses over the three mounting screw-holes. Release the adhesive portion of the template approximately 2 inches from top. Line up two holes with template. Slowly remove template backing and ascertain that 3rd hole is lined up before removing backing completely. It may be necessary to repeat this operation a few times before the template is positioned properly.
8. Drill a hole in the center of the bottom inner hat assembly large enough to insert the cutting snips. Cut out the hole, as indicated by the Template circle. Remove any remaining portion of the template from the bottom of the inner hat assembly.
9. Refer to Drawing S010-F3T4-DR005. Adhere the small template required to enlarge the hole in the top of the inner hat assembly. Using the cutting snips enlarge the hole to the size as indicated. Remove any remaining portion of the template from the top of the inner hat assembly.
10. Make certain there aren't any sharp edges or burrs on the surfaces of the holes that were cut or enlarged. Use an aluminum rasp to smooth edges. Remove metal particles with air blower or by gently tapping inner hat.

11. With a knife or other appropriate tool scrape the painted holes of the sensor plate, supplied with kit, to assure a good ground. Install the Rotron fan furnished in the mod kit on the sensor plate as shown in Drawing S010-F3T4. Secure the fan with the cleats, screws and washers as shown. (Note that airflow direction arrow conforms to Drawing S010-F3T4. Arrow direction is on fan.)

12. Insert the loose end of the power cord in one of the outer holes on the bottom plate of the inner hat assembly. Be sure that it is near the screw hole provided for the cable clamp.

13. Connect the ring lug provided in the mod kit to the green wire on the power cable. Carefully remove lugs provided with Rotron fan. Spaghetti both ends of C1, (.5 uf capacitor). Join one end of capacitor and white lead of power cable to one of these lugs. Crimp and solder. Connect the other end of capacitor to a fan lug. Crimp and solder. Connect the capacitor and power cable to the fan terminals as shown in Drawing S010-F3T4 wiring diagram.

14. Pot the terminal strip on the fan and the capacitor with the silastic RTV 732 provided.

15. Reassemble the inner hat assembly to the outer hat assembly. Be sure there is no strain or pressure pulling on the silicone sensor cable during assembly. Pull both cables through the outer hat and pipe mounting plate holes.

16. Slip the baffle ring in place over the silicone sensor cable of the temperature transducer housing, place the rotron fan mounted sensor plate on top of the temperature transducer housing, align the three mounting holes and secure it all to the bottom of the inner hat assembly. Refer to Drawing S010-F3T4. Make certain the power cord and the silicone sensor cable are in the proper position to be secured to the inner hat bottom plate. Secure these cables with the cable clamp.

17. Now that the Temperature Sensor Assembly is all assembled again, place it upside down so it is resting on the pipe mounting plate. That is, the Temperature Transducer is pointing upward.

18. Remove one screw securing the plate cover of the transducer housing and swing the plate cover to gain access to the transducer.

19. Install set screw into Thermal Mass and then install thermal mass. (See Drawing S010-F3T4), over the transducer and secure with long metric hex wrench. Replace the plate cover partially removed in Step 18.

20. Reinstall the Temperature Sensor Assembly to the AMOS channel strut reversing the procedure as outlined in Step 3.

21. Run the power cable for the fan along with the Temperature Cable and reverse procedure as outlined in Steps 1 and 2.
22. TURN OFF the ac power.
23. The Aspirator power cable has 3 wires: green, white, and black. Before stripping the wires, lay the cable out,
24. Cut the Aspirator power cable to size. Strip back 1/2" from each wire. Connect a ring lug to each wire and crimp.
25. Connect the cable in parallel with the ac power cable going to the terminal block on the chassis of the Temperature Power Supply Unit. The green wire goes to terminal marked GND (position 1). The black wire to terminal marked 115, and the white wire goes to terminal marked NEWT which is the third position on the block going from left to right.
26. Restore ac power. Be sure the aspirator fan is working.

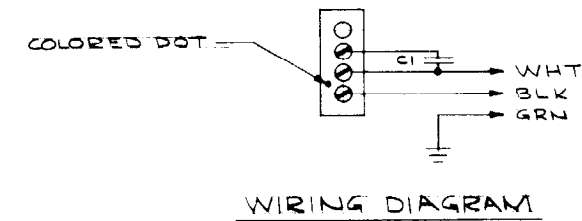
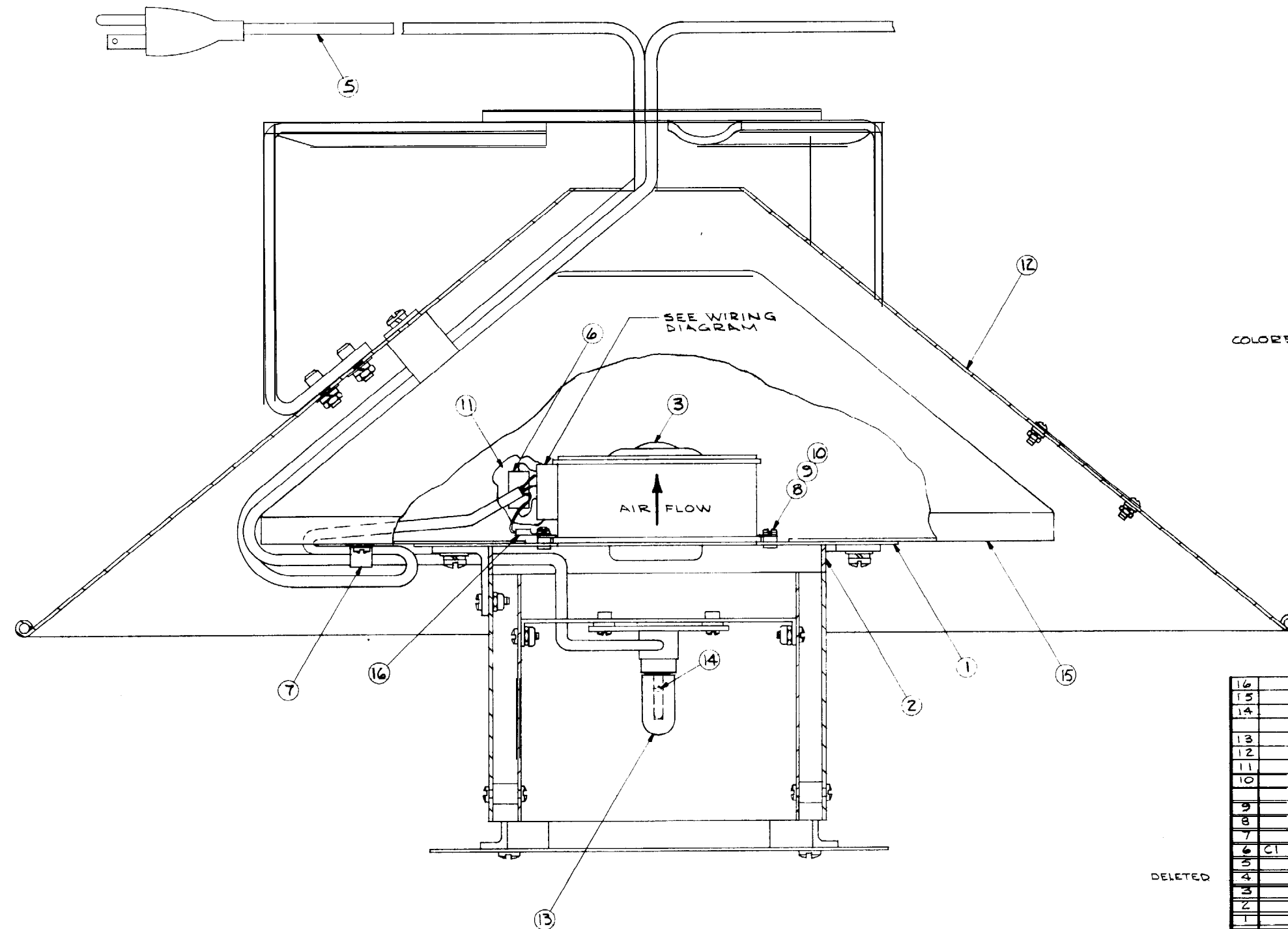
This completes the modification.

Manual Changes:

Add the following to Pages 2-55, 5-13, 5-23: Refer to Engineering Handbook No. 11, Section 3.2 Mod 3, Temperature Sensor Aspiration

Attachments: 2 Drawings
1 Form H-28

EHB-11
Issuance 79-9




REVISION			
No.	Description	By	Date
1	OMITTED FIND NO. 4 (AC. PLUG) & CHANGED FIND NO. 5 FROM 83395 TO 17409	LK	5-79

16	RING TERMINAL	1	4801	83330			
15	TEMPLATE APPLICATIONS	1	5010-FST4-DR005				
14	SET SCREW, HEX, CRES	1	M55Z-5	0041			
	M3 x 0.5,						
13	THERMAL MASS	1	5010-FST4-DR003				
12	TEMPERATURE ASSY	1	5010-F3T1				
11	SILASTIC RTV	AR	73Z	71984	SEE NOTE 1		
10	SCREW, BIND HD, CRES.	3					
	NO. 4-40UNC-2A, .38 LG						
9	WASHER, LOCK, NO. 4	3					
8	MOTOR MOUNT CLEAT	3	L2-2	00141			
7	CLAMP	1	5716-6	75987			
6	CI CAPACITOR, .5uf, 100v, 10%	1	CK16BR474K	31453			
5	CABLE WITH PLUG	1	17409	70905			
4							
3	FAN	1	5B7652H	82877			
2	BAFFLE RING	1	5010-FST4-DR002	C			
1	PLATE	1	5010-FST4-DR001	D			
FIND NO.	ELEC REF DES	NOMENCLATURE OR DESCRIPTION	QTY REQD	PART OR IDENTIFYING NO.	DWG SIZE	CODE IDENT	SPECIFICATION OR MATERIAL
LIST OF MATERIAL							

NOTE:
1. FIND NO. 6 AND THE WIRING TERMINALS OF FIND NO. 3 SHALL BE POTTED WITH ...
FIND NO. 11 SO THAT ALL EXPOSED WIRING AND CONNECTIONS ARE COVERED.

DELETED

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: ANGLES ± 5°		EQUIPMENT DEVELOPMENT LABORATORY SILVER SPRING, MD. 20910		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE	
3 PLACE DECIMALS ± .005 2 PLACE DECIMALS ± .02		DATE 8/24/78		RAMOS - AMOS - H063 ASPIRATED TEMPERATURE (T) SENSOR ASSEMBLY	
		PREPARED KOVARCIK EDL	SIZE D	DRAWING NO. 5010-F3T4	
		CHECKED EDL	SCALE	SHEET 1 OF 1 FILE	
		DESIGN EDL			
		APPROVED BY EDL			
APPROVED BY ED					



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

June 11, 1980

OA/W5141/JM

TO: All NWS Regional Headquarters, Area Electronics
Supervisors, and Electronics Technicians (EHB-11
Distribution)

FROM: OA/W51 - J. M. St. Clair

SUBJECT: Transmittal Memorandum for Engineering Handbook
No. 11, Issuance 80-4

1. Material Transmitted:

Engineering Handbook No. 11 - Automatic Observing
Equipment, Section 3.2, AMOS Modification No. 4: Power
On Pulses.

2. Summary:

Modification No. 4 provides Electronics Technicians with
instructions for modifying the AMOS 1A2A17 Battery Charger
Regulator printed circuit board.

3. Effect on Other Instructions:

Pen and Ink Changes are required in AMOS Manual 11-103.

4. Reporting Equipment Modifications:

All completed equipment modifications shall be reported
on the H-28 Engineering Progress Report. See attached
exhibit.

Attachment:
Form H-28 and Instructions

COPY

EHB-11
Issuance 80-4



AMOS MODIFICATION NOTE NO. 4
(for Electronics Technicians)

SUBJECT: Power On Pulses

PURPOSE: To Increase Reliability of Precipitation
Occurrence Module

EQUIPMENT AFFECTED: All AMOS 3-73

PARTS REQUIRED: Resistor, 15K ohms, 5%, 1/4W

MOD PROCUREMENT: Purchase Locally

TIME REQUIRED: 1 work-hour

GENERAL:

This modification will approximately triple the number of Power On Pulses. It will assure the resetting of the Precipitation Occurrence PCB 1A2A4 used in the AUTOB. Since this modification is on the 1A2A17 Battery Charger Regulator PCB, it is logistically desirable to have all AMOS stations incorporate the modification, even though it is primarily required for the AUTOB.

PROCEDURE:

Remove the 1A1A17 Battery Charger Regulator PCB from the AMOS. Locate R16, a 5.1K ohm resistor, and carefully unsolder and remove it from the board. Replace the removed resistor with a 15K ohm, 5%, 1/4W resistor. Return PCB 1A2A17 to AMOS. This completes the modification.

MANUAL CHANGES:

Make the following pen and ink changes to AMOS Manual 11-103. On page 2-233, change R16 to 15K. On page 2-235, note that in spec. no. 9 that the rise time constant is tripled, and in spec. no. 10, the number of power on pulses is tripled. On page 2-237, change value of R16 to read 15K ohms, 5%, 1/4 watt.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

October 28, 1982

OA/W5141 - TEC

TO: All NWS Regional Headquarters, Area Electronics Supervisors,
and Electronics Technicians (EHB-11 Distribution)

FROM: OA/W51 - J. Michael St. Clair

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11,
Issuance No. 82-6

1. Material Transmitted:

Engineering Handbook No. 11 - Automatic Observing Equipment, Section ~~3.2~~^{3.2},
Modification No. 5: Viking Connectors for Dewpoint Probe Cable.

2. Summary:

This modification is due to changes in manufacturing procedures and the decision to make the dewpoint probe a repairable stock item.

3. Effect on Other Instructions:

None.

4. Reporting Equipment Modifications:

Target date for reporting completion of this modification is
January 3, 1983.

All completed equipment modifications shall be reported on the H-28
Engineering Progress Report in accordance with EHB-4, Part 2.

5. Certification Statement:

This modification has been successfully field tested for system
operational integrity.

EHB-11
Issuance 82-6



Engineering Division
OA/W514

AMOS MODIFICATION No. 5
(For Electronics Technicians)

SUBJECT : Viking Connectors for the Dewpoint Probe Cable

PURPOSE : The modification makes YSI Dewpoint Probe No. 15210
(Removable Bobbin) Compatible with the YSI Dewpoint
Probe No. 1-17738 (Permanent Bobbin)

EQUIPMENT AFFECTED : All AMOS Sites

PARTS REQUIRED : 1 each Viking Connector VR7/4RS15
1 each Viking Connector VP7/4RP15

TOOLS REQUIRED : Standard Complement

TIME REQUIRED : 3 Work Hours

MOD PROCUREMENT : This modification will be issued upon receipt of NOAA Form
37-4 at Engineering Division, W5141, 8060 13th Street,
Silver Spring, Md. 20910, ATTN: Surface Project Leader.

If more than one modification is requested, the Location and
Organization Code of each must be stated on the 37-4 Form.

General: - This modification will update the dewpoint probe cable to accept the
new type dewpoint probe and will enable the technician to remove the dewpoint
probe for cleaning or replacement, with less effort.

PROCEDURE:

1. Remove the dewpoint probe cable assembly from the system and return to work bench area. Cover and protect both the dewpoint probe, the bobbin and the pins of the Viking Connector to prevent damage.
2. Measure 7 inches from the bottom end of the probe assembly and cut the cable.
3. Strip and prepare both sides of the cable for soldering into the Viking Connectors.
4. Use the male connector Viking No. VP7/4RP15 for the dewpoint probe assembly connection.
5. Use the female connector Viking No. VR7/4RS15 as the termination on the long cable.
6. Connect the cable as shown in Figure 1. It is recommended that the technician work on the long cable first to prevent irreversible error on the probe end.

7. After testing continuity of the cable, screw the cover on the connectors.
8. Clean and recharge the dewcell bobbin and reinstall at the site prior to turning system on.
9. Check system calibration. Recalibrate if necessary.
10. Spare dewcell probe: Remove connector, cut cable as in Step 2, and attach as shown in Figure 1.

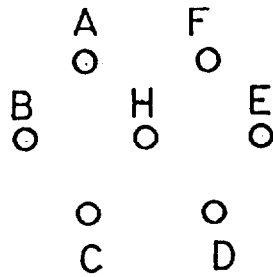
This completes the modification.

NOTE: The dewpoint probe is now a repairable item and should be sent to NRC for repairs as required.

Attachments:

Figure 1 - 1 each

Form H-28 - 1 each



WIRE ORDER FOR BOTH CONNECTORS

- | | |
|------------------|------------------|
| A. NO CONNECTION | E. WHITE WIRE |
| B. RED WIRE | F. NO CONNECTION |
| C. GREEN WIRE | H. SHIELD |
| D. BLACK WIRE | |

F I G U R E 1



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

W/OTS141 - WDH

TO: All NWS Regional Headquarters, Area Electronics Supervisors✓
and Electronics Technicians (EHB-11 Distribution)

FROM: W/OTS1 - J. Michael St. Clair

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11, Issuance 84-

1. Material Transmitted:

Engineering Handbook No. 11 - Automatic Observing Equipment, Section 3.2,
AMOS Modification Note 6: 1A2A1 Clock Replacement.

2. Summary:

This clock module replacement board is a direct, plug-in replacement for
the previous Bulova based clock board.

3. Effect on Other Instructions:

None.

4. Certification Statement:

This modification has been successfully field tested for system
operational integrity.

5. Reporting Modification to WSH Engineering Division:

Target date for reporting completion of this modification is

All completed equipment modifications shall be reported on the H-28 Form,
Engineering Progress Report, in accordance with EHB-4, Part 2.

EHB-11
Issuance 84-



AMOS CLOCK REPLACEMENT MODIFICATION NOTE 6
(for Electronics Technicians)

SUBJECT : Replacement of 1A2A1 Clock Assembly with 1A2A1A AMOS Clock Module.

PURPOSE : To replace a watch assembly no longer made by the manufacturer.

EQUIPMENT AFFECTED : All Defective AMOS 1A2A1 Clock Assemblies

PARTS REQUIRED : One 1A2A1A AMOS Clock Module.

MOD PROCUREMENT : This Modification will ~~be used to replace~~ ^{Replace} only those clocks which have become defective, ^{AND HAVE} ~~BEEN RETURNED TO NRC.~~

SPECIAL TOOLS : None.

REQUIRED

TEST EQUIPMENT : A 6-1/2 Digit Frequency Counter.

TIME REQUIRED : 1 Work Hour.

GENERAL:

The AMOS clock module is a 24 hour clock with LCD display that is based on the Intersil 7213 crystal controlled one-second timer. In addition to the timekeeping function, the board generates signals of 1 PPS for the peak wind processor, 1 PPM for the wind speed processor, and 120 PPS for the wind direction processor. An AMOS interrogation window is also created that allows the system to be interrogated during the eleven minute span from 55 minutes after the hour to 6 minutes after the hour. The window can also be manually controlled with switches S1 and S2, which open and close the window. The clock module board is a direct, plug-in replacement for the previous Bulova based clock board.

I. 1A2A1 CLOCK ASSEMBLY REPLACEMENT

← ~~X~~ Procedure: Parts 1 through 3 should be accomplished in completing this modification.

1. With power off, insert board into slot J101 on the far left front of the chassis. Turn power on and place switch S7 in the 'SET' position. This disables the clock and allows the operator to preset the counters to the desired time. Dial in a valid 24-hour format time on the thumbwheel switches, S3-S6. Pressing 'LOAD', S8, will then preset the counters to the thumbwheel values. At '00' seconds flip S7 to the 'RUN' position. This switch closure will advance the clock display one minute and begin counting from zero seconds.
2. The board will not normally require adjustments. The 7213 crystal oscillator has been through an initial burn-in and C2 has been properly adjusted. If long term drift is experienced and time accuracy has been lost, TP1 can be used to monitor the one-second pulses from the Intersil clock IC. Using a 7-digit frequency counter, adjust C2 to obtain a period of 1.000000 +/- .000002 second.
3. The new clock module derives power from the batteries/BCR circuit on Pin 28 of the edge card connector. During power failures the time keeping function will be lost unless the batteries are properly charged. This could pose a problem at unmanned AMOS stations and would require a special visit to the station to reset the time. Therefore, batteries must be operable for this clock board to be installed at an unmanned AMOS site.

II. INSTRUCTION MANUAL CHANGES

Make the following changes to AMOS Instruction Manual No. 11-103, Volume 2. Two each of the revised pages are attached to this note: One copy is to be added to the el tech's instruction manual and the other copy is to remain attached to this note.

- A. Instruction Material -- Make the following deletions.
 1. Volume 2 Pages 2-77 thru 2-86
- B. Schematics and/or diagrams -- replace 1A2A1 clock schematic in the following location:
 1. Volume 2 Page 2-79

c. Parts List --The following pages replace the corresponding pages in the manual.

1. Volume 2 Replace 1A2A1 Parts List Pages 2-85 and 2-86.

Additional Attachments:

A. AMOS Clock Circuit Description 1A2A1A Pages 4 and 5

B. AMOS Clock Test Procedure 1A2A1A Pages 6 and 7

C. Parts List Page 8

Two copies of "Additional Attachments" should be sent with each Transmittal Memorandum.

AMOS CLOCK CIRCUIT DESCRIPTION

CLOCK REFERENCE

The AMOS clock replacement module is based on Intersil's 7213 precision one-second timer. Pin 16 is the one pulse per minute (one second pulse width) output and is used: 1) to clock the BCD counters (U2-U5) and 2) as an input to pulse width control circuit (U15). Pin 2 is a one-pulse per second (7.8ms pulse width) output and is used to clock the forty-second timer circuit and as an input to the pulse width control circuit. R4 and R5 form a voltage divider to furnish a supply voltage of about 3.5 volts (pin 10), which is the optimum voltage for 4.2 MHz operation. A test point is provided to adjust the oscillator circuit. Trim capacitor C2 should be adjusted to obtain a period of 1.000000 +/- .000002 seconds.

BCD COUNTERS

BCD up counters are used for counting the one minute pulses. Pins 7 and 10 are enable inputs and must be high to count. The counters are preset by taking Pin 9 low and manually applying a clock pulse (S8) at Pin 2.

Reset Functions:

1. The ten-minute counter (U4) is reset every 60 minutes by the low output of U13 Pin 15.
2. The output of U-11 Pin 10 generates a "carry" at the 59th minute in order to increment unit hours (U3) on the next clock pulse.
3. A low on U13 Pin 12 resets units and tens hours (U3 and U2) at 24:00 hours to 00:00 hours.

DISPLAY AND DRIVERS

The display is driven by U6-U9 which are BCD to seven segment decoder/drivers. The BCD output of the counters is the input of the drivers, which convert the 4 bit BCD into seven segment information. A 30 hertz square wave oscillator is applied to the drivers and the backplane of the display. The oscillator is crucial to proper operation in that it greatly extends the useful life of the display.

WINDOW CONTROLS

No Interrogation

The dual flip-flop U19 controls the window status. U11 pin 9 detects 55 minutes, puts a high on U19 Pin 6, and 'opens' the window by taking the 1 Hour signal low. 1 Hour will stay low until the AMOS is interrogated, or six minutes after the hour, whichever comes first. U12 pin 11 detects six minutes after the hour and puts a high on U19 pin 4, which resets the flip flop and closes the window by taking 1 Hour high.

Interrogation

A station call with the window open causes the AMOS to print its message. After the message is printed, a timer is activated that will close the window forty seconds later (this delay allows the operator multiple interrogations before the data is reset) or at six minutes after the hour, whichever comes first.

With the window open (1 Hour low):

1. A station call sends reset low and then high at message completion. The high transition clocks the low on U19 pin 9 through and sets Q, pin 12, high.
2. U12 pin 10 goes high which enables U17, the units digit counter of the 40 second timer. Every ten seconds U18 is incremented. Pin 12 of U18 signals 40 seconds on the high transition and clocks through the low on U19 pin 5, thus closing the window.

TIMING PULSES

The 120 PPS signal is developed with a full wave bridge and then sent through a Schmitt trigger to square the signal at U16 pin 3. The 120 PPS is used to clock the pulse width control flip flops U10 and U15 to obtain 8.3ms pulse widths on the 1PPS and 1PPM signals.

AMOS CLOCK TEST PROCEDURE
1A2A1A

A. EQUIPMENT REQUIRED

1. AMOS Clock Card
2. +4.5 Vdc power supply
3. 12.6 Vac center tap transformer
4. Oscilloscope
5. Frequency counter that measures period, 6 1/2 digits minimum

B. EDGE CARD CONNECTOR P1

Configure an edge card connector as follows:

P1-28	+4.5 Vdc
P1-30	Return
P1-1	Return
P1-8	Reset (see Figure 1)
P1-26	12.6 Vac Hi (see Figure 1)
P1-25	12.6 Vac Lo (see Figure 1)

C. TEST PROCEDURE

1. Verify S7 is in the "RUN" position. With power on measure the period of the digital signal between TP1 and ground (P1-1). Adjust C2 for a period of 1.0 +/- .000002 seconds.
2. Place S7 to the "SET" position. Dial in the time of 2358 on the thumbwheel switches S3-S6. Press "LOAD", S8, once and verify 2358 appears in the display. Flip S7 to the RUN position. The display should increment to 2359. After sixty seconds the display should turn over to 0000.
3. Connect an oscilloscope probe to P1-22 and set scope for vertical sensitivity of 1 Volt/div and sweep speed of 500 ms/div. Place S7 in the SET position, set thumbwheel switches for 0953, and press LOAD to verify a display of 0953. Flip S7 to RUN, time should increment to 0954, and sixty seconds later the display should read 0955. On the 55th minute P1-22 goes to logic low.

4. Place S7 in the SET position, set thumbwheels to 0905, and press LOAD to verify display of 0905, While monitoring P1-22 (should still be logic low from Step #3), toggle S7 to RUN. The display should read 0906 and P1-22 should be logic high.
5. Press S1 "OPEN" and verify P1-22 goes low. Press S2 "CLOSE" and verify P1-22 goes high.
6. Verify the signal on P1-21 has a period of 8.3 ms +/- 0.1 ms.
7. Verify the signal on P1-24 has a period of 1 second and a pulse width of 8.3 ms +/- 0.1 ms.
8. Verify the signal on P1-23 has a period of 1 minute and a pulse width of 8.3 ms +/- 0.1 ms.
9. Place S7 in the SET position, thumbwheels at 0959, and press LOAD to verify 0959 in the display. Toggle S7 to the RUN position and verify a display of 1000. Press S1 and verify P1-22 goes low. Now press and release Reset switch connected to P1-8 and verify signal on P1-8 goes low and then high. The signal on P1-22 goes high 40 seconds after P1-8 goes from low to high.

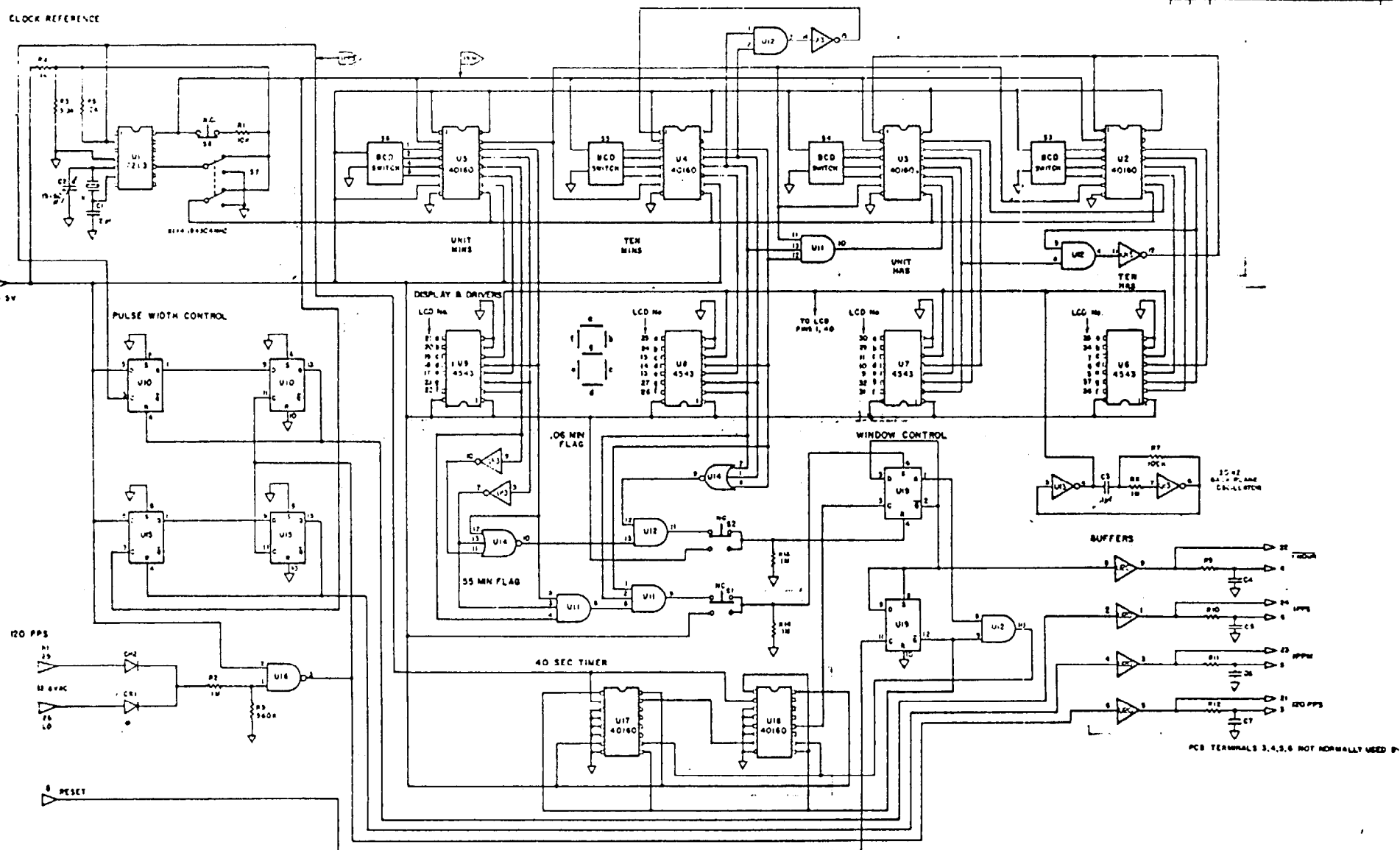
This completes testing on the AMOS 1A2A1A Clock Card.

PARTS LIST

U1	ICM7213I PL	Intersil	1 Second Precision Timer
U2-U5, U17, U18	MC14160B	Motorola, etc.	BCD Decade Counter
U6-U9	MC14543B	Motorola, etc.	LCD Driver, BCD to 7 Seg.
U10, U15, U19	MC14013B	Motorola, etc.	Dual D Flipflop
U11	MC14073B	Motorola, etc.	Triple 3 Input and
U12	MC14081B	Motorola, etc.	Quad 2 input and
U13	MC14049B	Motorola, etc.	Hex Inverter/Buffer
U14	MC14025B	Motorola, etc.	Triple 3 Input Nor
U16	MC14093B	Motorola, etc.	Quad Nand, Schmitt Trig
U20	DS3630N	National Semi	Hex CMOS Buffer
LCD-1	739-54-2-1	Beckman	LCD Display
S1, S2, S8	39-251	Grayhill	SPDT Switch
S3-S6	1A267056G	EECO	SPDT Thumbwheel
S7	7201MD9AG	C&K	DPDT Switch
X1	CY4E	Crystek	Crystal, 4.194304 MHz
C1	12pf, 50v		Capacitor
C2	538-011F-15-60	Erie	Trim Capacitor, 15-60 pf
C3	.1uf	Erie	Capacitor, Redcap
C4-C7	.01uf	Not normally used	
CR1, CR2	1N4002		Diode, Rectifier
R1, R6	10K		Resistor, +/-5%, 1/4 Watt
R2, R8, R13, R14	1M		" " "
R3	560K		" " "
R4	1K		" " "
R5	3.9K		" " "
R7	100K		" " "
R9-R12	100	Not Normally used	" " "
TP1	UT17-035	Voltrex	Solder Terminal

BCD COUNTERS

CLOCK REFERENCE



AMOS Clock Module 1A2A1A

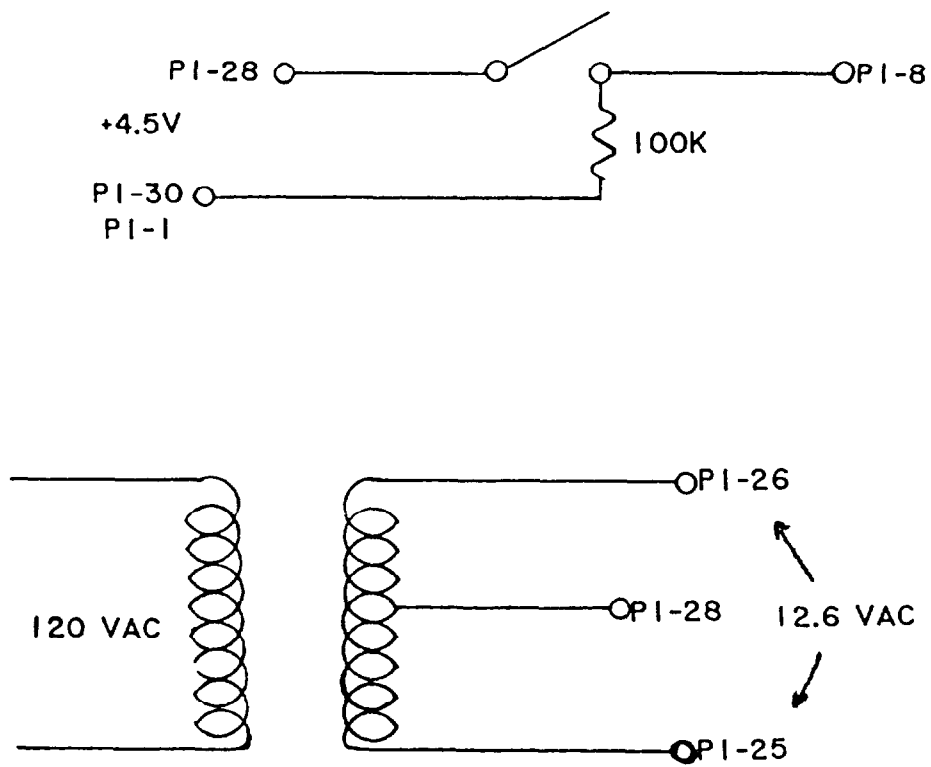


FIGURE 1



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

W/OTS13 - RCA

TO: All NWS Regional Headquarters, Area Electronics Supervisors,
and Electronics Technicians (EHB-11 Distribution) ✓

FROM: W/OTS1 - J. Michael St. Clair *J. M. St. Clair*

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11, Issuance 85-

1. Material Transmitted:

Engineering Handbook No. 11, Automatic Observing -Equipment, Section 3.2
AMOS Modification Note 7: Conversion to RS232C Communications.

2. Summary:

Modification Note 7 provides instructions for converting the AMOS
communications from Service A teletype loop (Baudot) to direct-dial
telephone network (ASCII).

3. Effect on Other Instructions:

Inserts for AMOS Manuals (11-103) will be available through NLSC.

4. Certification Statement:

This modification has been tested for operational integrity by the
Operational Systems Engineering Branch.

5. Reporting Modification to WSH Engineering Division:

Target date for completion of this modification is November 1, 1985.

All completed equipment modifications shall be reported as instructed in
EHB-4 Part 2 (Engineering Progress Report, WS Form H-28) within 28 days of
completion.

EHB-11
Issuance 85-



AMOS MODIFICATION NOTE 7
(For Electronics Technicians)

SUBJECT : Conversion to RS232C Communications:

PURPOSE : To allow for data collection by the Centralized Automatic Data Acquisition System (CADAS) after the deactivation of Service A.

EQUIPMENT AFFECTED : AMOS's and AUTOB's in all regions except Alaska Region.

PARTS REQUIRED : 1 - Hookup wire, #24 AWG, 24" long, white
1 - Shrinkable tubing, 1/8" x 2" long
1 - Shrinkable tubing, 1/16" x 1" long
1 - S007-1A2A15C RS232COM PCB and schematic
2 - Return mail labels

And for non-MED AMOS's:
1 - S090-1W1 Modem Cable
1 - Hayes Smartmodem 300, with manual and accessories

MOD PROCUREMENT : All parts will be shipped directly to affected stations by NWS Headquarters.

SPECIAL TOOLS REQUIRED : None

TEST EQUIPMENT REQUIRED : 110-baud terminal with modem (can be remote)

TIME REQUIRED : 4 work hours

General :

The Service A teletype loop, which uses 75-baud Baudot code, is being deactivated. In order that AMOS (and AUTOB) data may continue to be collected, the AMOS's are being converted to direct-dial telephone network communications using 110 baud ASCII code. This modification includes: chassis wiring modifications, printed circuit board substitution, and (for non-MED AMOS's) modem installation. AMOS stations having a Manual Entry Device (MED) should have this modification installed at the same time as MED Modification No. 4.

Procedure:

1. If this is a MED AMOS, turn power off to AMOS chassis, unplug power cable, and skip to step 7.
2. Verify telephone line has been installed and is operating correctly.
3. Contact Mr. Elroy McLeod, W/OTS31, FTS or (301) 763-7400, and give him the station identifier and the telephone number. He will enter this data into the CADAS program. Within approximately one hour, CADAS will begin periodically calling your telephone. Wait until this happens before continuing with this procedure.
4. Turn power off to AMOS chassis. Unplug power cable.
5. Locate the cable from Control Console TB3 - 1 & 2 (or Chassis TB102- 1 & 2 if TB3 is not used) to the Local Readout Box. First, unplug it from the Local Readout Box. Then, disconnect it from TB3, and remove it.
6. Remove the cable between TB3-5&6 (or TB102-3&4 if TB3 is not used) and the Local Readout Box.

NOTE: The Local Readout Box, FAA Stunt Box, and teletype will be removed after the Service A loop is disconnected from your station.

7. While the AMOS chassis modification can be performed with the chassis in the Control Console rack, it may be easier to remove the chassis to a workbench. Disconnect the 1A2A18 battery pack.
8. Remove the TW or TWA card from J115 and set it aside.
9. Unsolder the two shielded cables from TB102. (TB102 is accessed from underneath the chassis.) (Leave the ground wire from E101-4 attached to TB102-3.)
10. Use a piece of insulated hookup wire supplied to connect TB102-1 to TP125 (see Vol. 2, pages 2-67 & 2-75 of AMOS Instruction Manual 11-103).
11. Remove the Teletype Relay (TWR) A101 mounting screws. Lift the TWR card up so you can access the wires connected to it.

12. Unsolder or clip the wire connected to TWR-B (at the TWR board). Pull this wire back through the grommet to the underside of the chassis, and solder it to TB102-2. You may have to splice an extension to this wire, if it is too short. The wire and 2" shrinkable tubing is provided for this reason.
13. Unsolder or clip the wire connected to TWR-SC (at the TWR board). Pull this wire back through the grommet to the underside of the chassis, and solder it to TB102-4.
14. Locate the wires connected to the TWR-V and TWR-GND. Follow these wires down through the grommet and find their termination. Unsolder or clip these wires.
15. Pull the shielded cables and TWR-GND & TWR-V wires disconnected in steps 9 & 14 up through the grommet, and remove the TWR board and mounting bracket and shielded cables. Remove the loose wires from the TWR board and set it aside.
16. Locate J101-27. Note that there are two wires connected to it. One is routed between connectors J101 and J102. The other is routed toward the edge of the chassis. Unsolder or clip the wire routed toward the edge of the chassis. Insulate the bare end with the 1" shrinkable tubing provided.
17. Install new RS232COM card into J115. Switches S3 and S4 should be set to NORMAL. Switch S1 should be set to AUTOB if this station is an AUTOB or has a MED; otherwise, switch S1 should be set to AMOS.
18. Return the AMOS chassis to the rack, if removed in step 7. Reconnect the 1A2A18 battery pack. (This completes the procedure for a MED AMOS.)
19. Connect the modem RS232C cable to TB3 (or TB102 if TB3 is not used):

<u>TB102</u>	<u>TB3</u>	<u>Color</u>	<u>Function</u>	<u>Modem</u>
1	1	red	Received Data	3
2	2	green	Transmitted Data	2
3	5	black	Signal Ground	7
4	6	white	Carrier Detect	8

20. Install the modem, referring to chapters 2 and 8 of the modem manual. The configuration switches should be positioned as follows:
 - Switches 3, 5, 6, and 7 up;
 - Switches 1 and 4 down;
 - Switches 2 and 8 either position
21. Plug in AMOS power cable. Turn power on to modem, first. Then turn power on to AMOS chassis. NOTE: Power may be applied to both at the same time, but if power is applied to the AMOS first, the telephone line disconnect features may not work.
22. Using another telephone and a 110 baud terminal and modem, call the AMOS telephone number. Wait until the communications link has been established.
23. Type a capital O on the terminal, and the AMOS should transmit its message.
24. Type an ESCAPE on the terminal, and the AMOS should break the communications link (hang up) after a few seconds (see note on Step 21).
25. Repeat step 22 to reestablish the communications link.
26. Verify that the AMOS breaks the communications link (hangs up) after one minute of no activity on both the terminal and the AMOS.
27. If the AMOS has functioned properly, declare the AMOS operational. If you encounter difficulties, seek help from: first, your AES; second, your regional electronics branch specialist; third, your NWSH Engineering Division (Mr. Rick Ahlberg - FTS or (301) 427-7842).

This completes the Non-MED AMOS Baudot to ASCII conversion.

Disposition of Removed Parts:

The following removed parts (and spares, if any) are to be returned using the pre-addressed label provided:

S007-1A2A15 or S007-1A2A15A, TW or TWA PCB's

S007-1A2A19, TWR PCB's

Please pack the second return address label inside the box, and identify the station(s) which the parts are from. Fill out the return receipt so that you will get confirmation that parts were received.

Instruction Manual Changes:

Inserts for the AMOS Instruction Manual, Volumes 1 & 2 will be provided at a later date. Stations and regional offices will be notified when the inserts are available.

Attachment: WS Form H-28 - Engineering Progress Report

COPY



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

April 19, 1985

W/OTS13: RCA

TO: All NWS Regional Headquarters, Area Electronics Supervisors,
and Electronics Technicians (EHB-11 Distribution)

FROM: W/OTS1 - J. Michael St. Clair

A handwritten signature in dark ink, appearing to read "J. Michael St. Clair", written over the printed name.

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11, Issuance 85- 1

1. Material Transmitted:

Engineering Handbook No. 11, Automatic Observing Equipment, Section 3.2;
Modification Note 8, AMOS Precipitation Accumulation Module, Reset
Elimination.

2. Summary:

Modification Note 8 provides instructions to prevent erroneous reset of
the Precipitation Accumulator Counter. This modification is to be used
only on AMOS's in the Alaska Region.

3. Effect on Other Instructions:

None.

4. Certification Statement:

This modification has been tested by the Engineering Division, W/OTS13,
and has performed as required.

5. Reporting Modification to WSH Engineering Division:

Target date for completion of this modification is September 30, 1985.

All completed equipment modifications shall be reported as instructed in
EHB-4, Part 2, Engineering Progress Report, WS Form H-28.

EHB-11
Issuance 85- 1



Engineering Division
W/OTS14

AMOS MODIFICATION NOTE 8
(For Electronics Technicians)

SUBJECT : AMOS Precipitation Accumulation Module, Reset Elimination

PURPOSE : To prevent erroneous reset of the Precipitation Accumulator Counter

EQUIPMENT AFFECTED : All AMOS's in Alaska Region

PARTS REQUIRED : #22 AWG insulated wire, 3 inches

MOD PROCUREMENT : Procure locally, if not already on hand

SPECIAL TOOLS : None

TEST EQUIPMENT : None

TIME REQUIRED : 1 Work Hour

General:

At some AMOS locations, the precipitation accumulation counters frequently reset at the wrong hours. This, combined with communications outages, often makes it difficult to determine exactly how much rain has fallen at AMOS sites. This modification disables the six-hour reset function, and then the counters will count up to a maximum of 9.99 inches. On the next tip of the tipping bucket gauge, the counters will read 0.00 inches. Pressing pushbutton S2 will force a manual reset. This feature will prove helpful when replacing a defective module or battery.

Procedure: Steps 1 through 14 should be accomplished in completing this modification.

1. Power down AMOS and remove the Precipitation Accumulation Module (S007-1A2A14) to a suitable work area.
2. Using attached Figures 1, 2, and 4; locate the land emanating from integrated circuits 7C, pins 2 and 10; and 10D, pin 3. Using a very sharp knife, "Exacto" or equal, remove a small portion of the land identified in Figure 2. This will disconnect the "SET" output of the "TRANSFER GATE" from the "SET" input of the "PRECIPITATION COUNTER."

3. Using the attached Figures 1, 3, and 4; locate the feedthrough next to integrated circuit 3B, pin 3. Install a piece of insulated wire on the component side of the board. One end is to be soldered in the feedthrough. The other end is to be soldered to the normally open (center) contact of switch S2. This connects the "SET" input of the "PRECIPITATION COUNTER" to switch S2.
4. Install the module in the AMOS and power up. Verify operation by performing the following tests. These tests should be started after one hourly window and should be completed before the next hourly window; that is, start after 6 minutes after the hour (by the clock module) and finish by 55 minutes after the hour.
5. Place station on local line for local teletypewriter printout. Install test jumper on Teletype (TW) Module. Place Test-Operate Switch, S1, in the Normal, single observation position.
6. Press switch S2 on Precipitation Accumulation (PA) Module. Interrogate the AMOS by pressing switch S2 on TW module. Precipitation field should read 000.
7. Tip the tipping bucket several times. (Allow 2 seconds between tips). Interrogate the AMOS. Precipitation field should read the number of tips.
8. Repeat Step 6 to verify that the manual reset function works.
9. Press and hold switch S2 on PA Module to power clock monitor lamps. Using switch S1 on PA Module, advance clock to the fifth hour; that is, both outside clock monitor lamps on. Release switch S2, extinguishing lamps.
10. Repeat Step 7.
11. Press switch S1 on the Clock Module. Interrogate the AMOS. Precipitation field should not have changed from Step 10.
12. Press switch S2 on the Clock Module. Interrogate AMOS. Precipitation field should not have changed from Step 11. This verifies that the six-hour reset no longer functions.
13. Repeat Step 6. Clock monitor lamps should be out while switch S2 (PA Module) is pressed. This verifies the clock was advanced to the zeroth hour in Steps 11 and 12.

14. This completes the verification. Advance the PA clock to the correct hour, remove the test jumper from the TW Module, and place the station back on line.

Instructions Manual Changes:

A. Instruction Material:

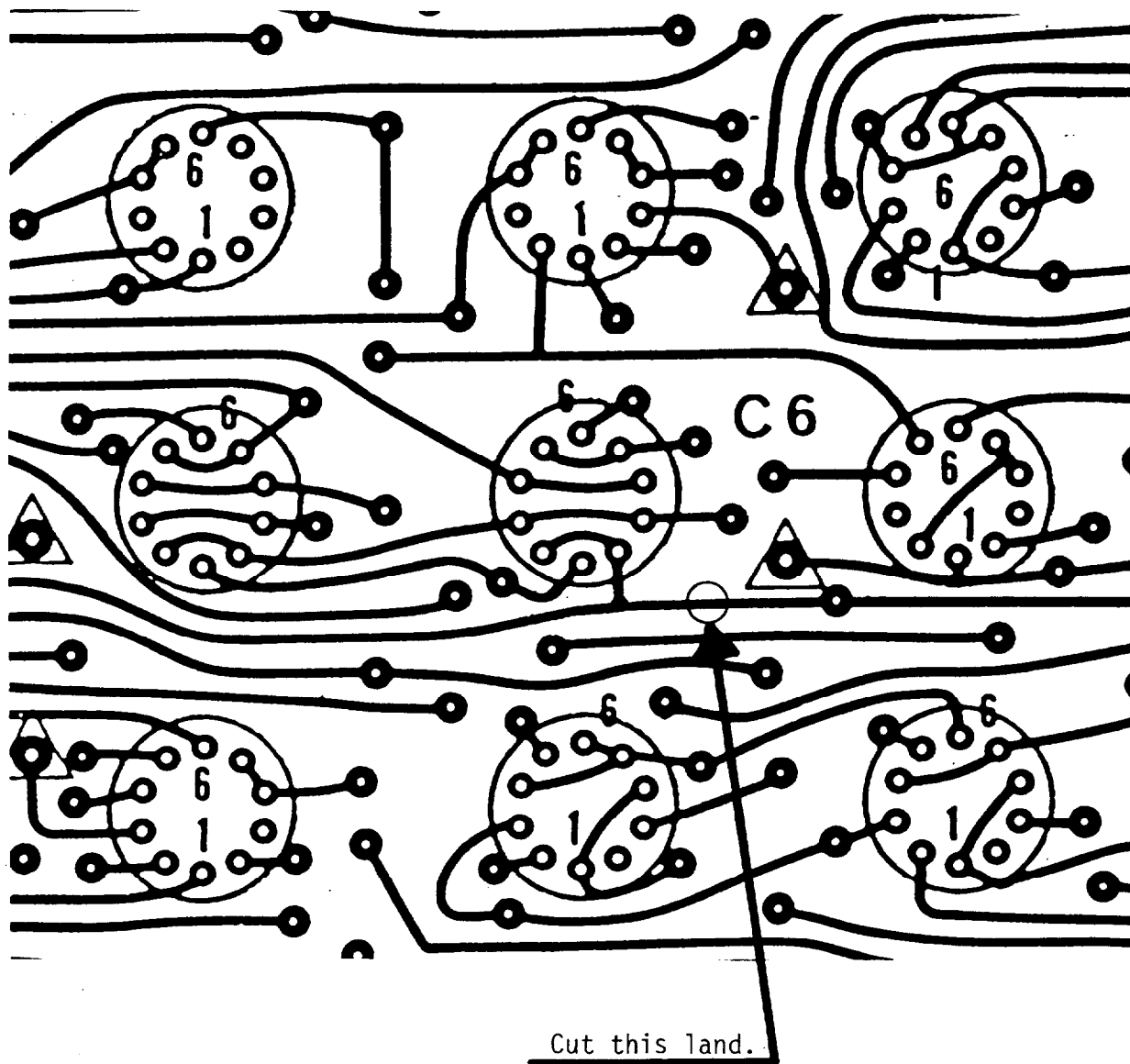
None.

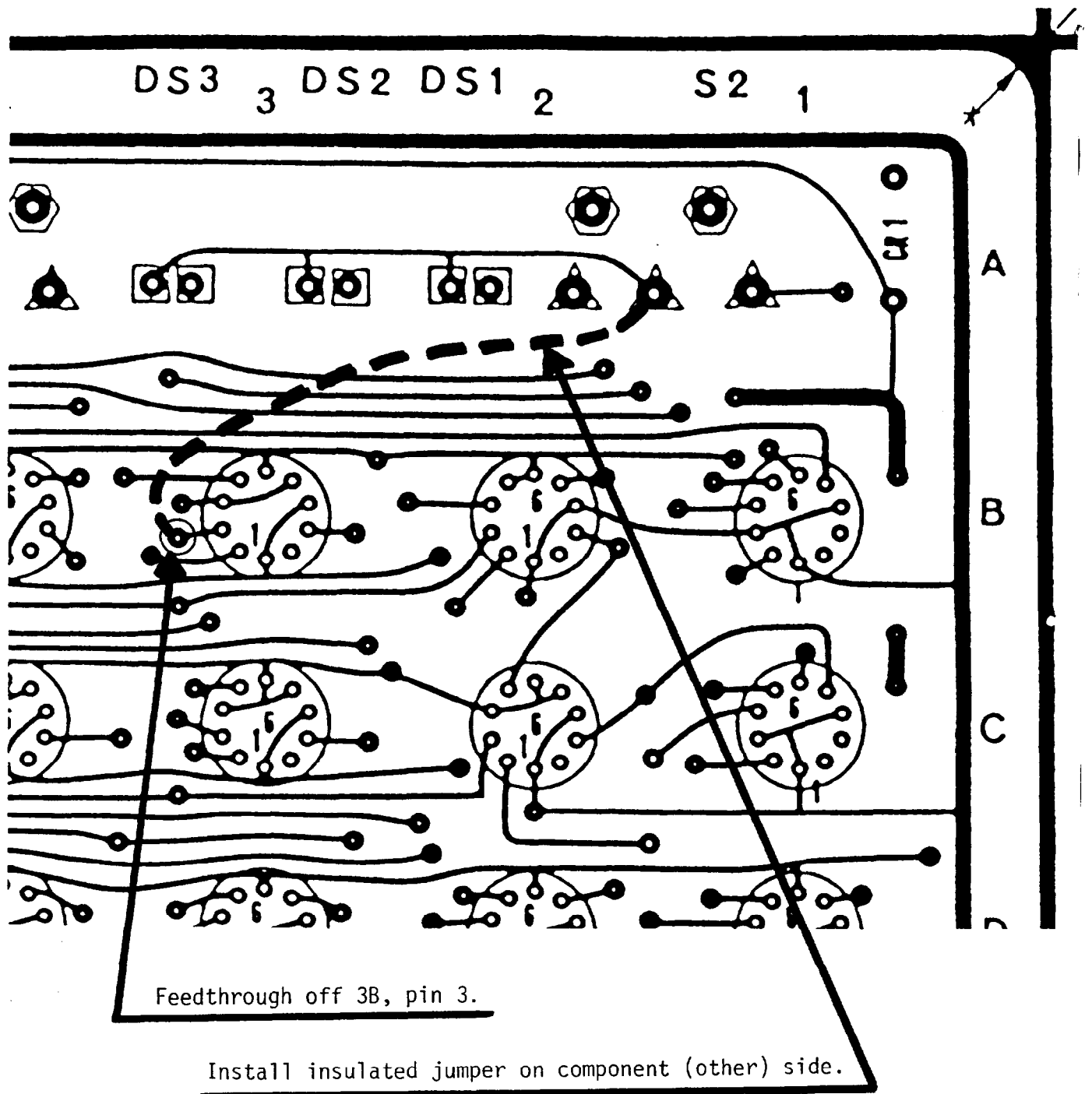
B. Schematics and/or Diagrams:

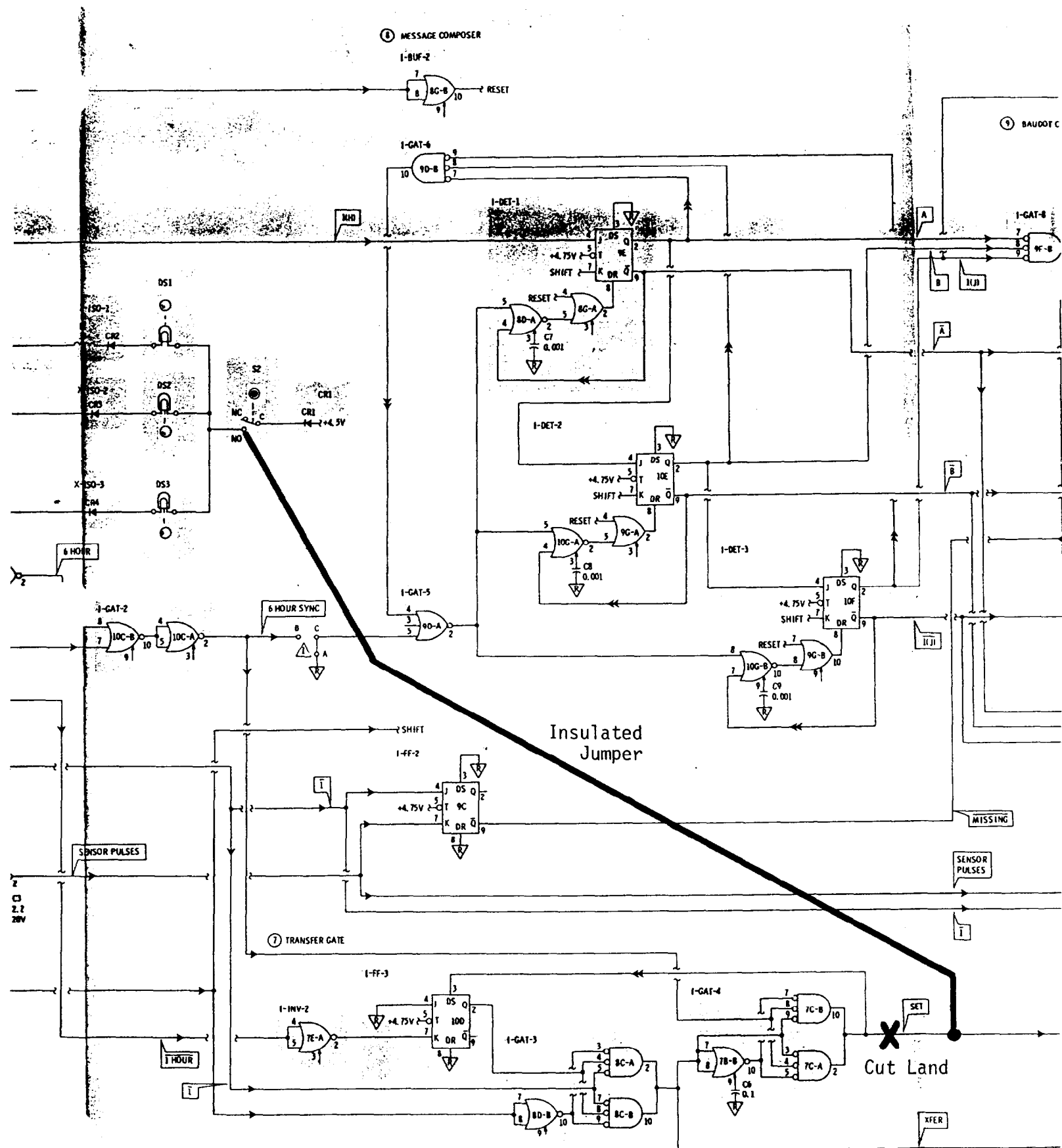
Place second copies of Figures 1 through 4 (attached) in front of p. 2-195 in AMOS manual.

C. Parts List:

None.









U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

December 23, 1985

W/OTS13: RCA

TO: All NWS Regional Headquarters, Area Electronics Supervisors,
and Electronics Technicians (EHB-11 Distribution)

FROM: W/OTS1 - J. Michael St. Clair *J. M. St. Clair*

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11, Issuance 85-4

1. Material Transmitted:

Engineering Handbook No. 11, Automatic Observing Equipment, Section 3.2;
Modification Note 9, AMOS Precipitation Accumulation Module, Reset
Function Change.

2. Summary:

Modification Note 9 provides instructions to assure reset of the
Precipitation Accumulator Counter. This modification is to be used on all
AMOS's except those in the Alaska Region.

3. Effect on Other Instructions:

Pen and ink changes to manual.

4. Certification Statement:

This modification has been tested by the Engineering Division, W/OTS13,
and has performed as required.

5. Reporting Modification to WSH Engineering Division:

Target date for completion of this modification is January 3, 1986.

All completed equipment modifications shall be reported as instructed in
EHB-4, Part 2, Engineering Progress Report, WS Form H-28.

EHB-11
Issuance 85-4



Engineering Division
W/OTS14

AMOS MODIFICATION NOTE 9
(For Electronics Technicians)

SUBJECT : AMOS Precipitation Accumulation Module, Reset Function Change

PURPOSE : To assure reset of the Precipitation Accumulator Counter

EQUIPMENT AFFECTED : All AMOS's except those in Alaska Region

PARTS REQUIRED : #22 AWG insulated wire, 8 inches

MOD PROCUREMENT : Procure locally, if not already on hand

SPECIAL TOOLS : None

TEST EQUIPMENT : None

TIME REQUIRED : 1 Work Hour

General:

With the implementation of-AMOS Modification Number 7, each AMOS is now called by the Centralized Automatic Data Acquisition System (CADAS). As the AMOS is now connected to the telephone system, other users may call it as well. This modification will correct two precipitation accumulation reset errors caused by the change in communications from the "Service A" teletype circuit to the direct-dial telephone network.

Error number one is that the precipitation accumulation counter does not reset sometimes. The AMOS must be interrogated during the "hour window" at the synoptic (sixth) hour to reset the precipitation accumulation counter. The "hour window" opens at 5 minutes to the hour. It closes at 6 minutes after the hour or 40 seconds after an interrogation, whichever occurs first. Sometimes CADAS does not call some AMOS's during the "hour window" and therefore the precipitation accumulation counter does not reset.

Error number two is that the precipitation accumulation counter resets before the second (or subsequent) user calls at the synoptic time. The first caller during the "hour window" at the synoptic hour gets the six hour precipitation accumulation. Forty seconds later the "hour window" closes, resetting the precipitation accumulation counter.

(General Continued)

The next caller gets a precipitation accumulation of zero (or a small amount if it happens to be precipitating).

This modification will eliminate both errors. The precipitation accumulation counter will be reset 5 minutes to the synoptic hour, but the AMOS will hold and transmit the six hour accumulation until 6 minutes after the synoptic hour. It thus makes the reset of the precipitation accumulation counter independent of both the time and the number of AMOS interrogations.

In conclusion, after this modification the AMOS precipitation accumulation data will indicate the following. From 5 minutes before until 6 minutes after the synoptic hour, the AMOS will report the 6 hour accumulation. At all other times, the AMOS will report the accumulation since 5 minutes before the synoptic hour.

Procedure: Steps 1 through 18 should be accomplished in completing this modification.

1. Power down AMOS (including disconnecting the batteries) and remove the Precipitation Accumulation Module (S007-1A2A14) to a suitable work area.
2. Using attached Figures 1, 2, and 4; locate the land emanating from integrated circuit 8C, pin 7. Using a very sharp knife, "Exacto" or equal, remove a small portion of the land identified in Figure 2. (The suggested method is to cut the land on either side of the section to be removed. Then using a soldering iron, heat the section to be removed until it separates from the fiberglass-epoxy board.) This will disconnect the "1" output of the "INVERTER" from the "I-GAT-3" of the "TRANSFER GATE".
3. Repeat Step 2 on the land emanating from integrated circuit 8D, pin 10. This will disconnect the inverted 'SHIFT' output of the "BUFFER" from integrated circuit 8C, pins 3 and 9.
4. Using the attached Figures 1, 3, and 4; locate the feedthrough next to integrated circuit 8D, pin 10. Install a piece of insulated wire on the component side of the board. One end is to be soldered in the feedthrough. The other end is to be soldered to the feedthrough on finger P1-21. This connects an "I-GAT-3" input of the "TRANSFER GATE" to the "120PPS" signal.
5. Install the module in the AMOS.

6. Determine which version of the Clock Module is in the AMOS. The old Clock Module (S007-1A2A1) requires no modification: the chassis modification in AMOS Modification Number 7 (Step 16) eliminated the closing of the "hour window" 40 seconds after an interrogation. If the AMOS has the old Clock Module, then skip to Step 10. If the AMOS has the new Clock Module (S007-1A2A1A), remove it to a suitable work area.
7. Using attached Figures 5, 6, and 7; locate the land running between U18-12 and U19-3. Remove a small portion of the land identified in Figure 6. This will disconnect the "40 SEC TIMER" output from the "WINDOW CONTROL".
8. Using attached Figures 6 and 7; locate the feedthrough connected to U18-3 (ground). Install a wire jumper on the circuit (non-component) side of the board between the feedthrough and the cut land as shown in Figure 6. This grounds the "WINDOW CONTROL" flip-flop clock input.
9. Install the module in the AMOS.
10. Power up, set the clock, press switch S2 on the Clock Module (to close the hour window), and place the AMOS in local (test) mode. Perform the following tests to verify this modification. These tests should be started after one hourly window and should be completed before the next hourly window; that is, start after 6 minutes after the hour (by the clock module) and finish by 55 minutes after the hour.
11. Interrogate the AMOS by pressing switch S2 on the RS232COM Module. Note the precipitation accumulation field.
12. Tip the tipping bucket several times. (Allow 2 seconds between tips). Interrogate the AMOS. Precipitation field should have increased by the number of tips.
13. Press and hold switch S2 on PA Module to power clock monitor lamps. Using switch S1 on PA Module, advance clock to the fifth hour; that is, both outside clock monitor lamps on. Release switch S2, extinguishing lamps.
14. Repeat Step 12.
15. Press switch S1 on the Clock Module (to open the hour window). Interrogate the AMOS. Precipitation field should not have changed from Step 14.

16. Tip the tipping bucket several times. Interrogate the AMOS. Precipitation field should not have changed from Step 15.
17. Press switch S2 on the Clock Module (to close the hour window). Interrogate the AMOS. Precipitation field should show the number of tips done in Step 16. Clock monitor lamps should be out while switch S2 (PA Module) is pressed. This verifies the clock was advanced to the zeroth hour.
18. This completes the verification. Advance the PA clock to the correct hour. Place the station back on line.

Instructions Manual Changes:

A. Instruction Material:

Make pen and ink changes:

Volume I, page B; add Change 13, Modification Note No. 9, pages 2-78a-c, 2-194e-h.

Volume II, page 2-3; add pp. 2-78a--2-78c...13*
2-194e--2-194h...13*

Change 13 applies to all except Alaska Region
(Modification Note No. 9)

Volume II, page 2-78 (old Clock Module); add note to #7, TRANSMIT DELAY: BAUDOT disconnected in Modification No. 7. TRANSMIT DELAY circuit inoperative.

Volume II, page 2-78 (new Clock Module, Modification Note No. 6, 5). add note to WINDOW CONTROLS: 40 SEC TIMER disconnected from WINDOW CONTROLS in Modification No. 9, window always closes at 6 minutes after the hour.

Volume II, page 2-193; in #7, TRANSFER GATE, line out "T is low, and SHIFT" and replace with "120PPS".

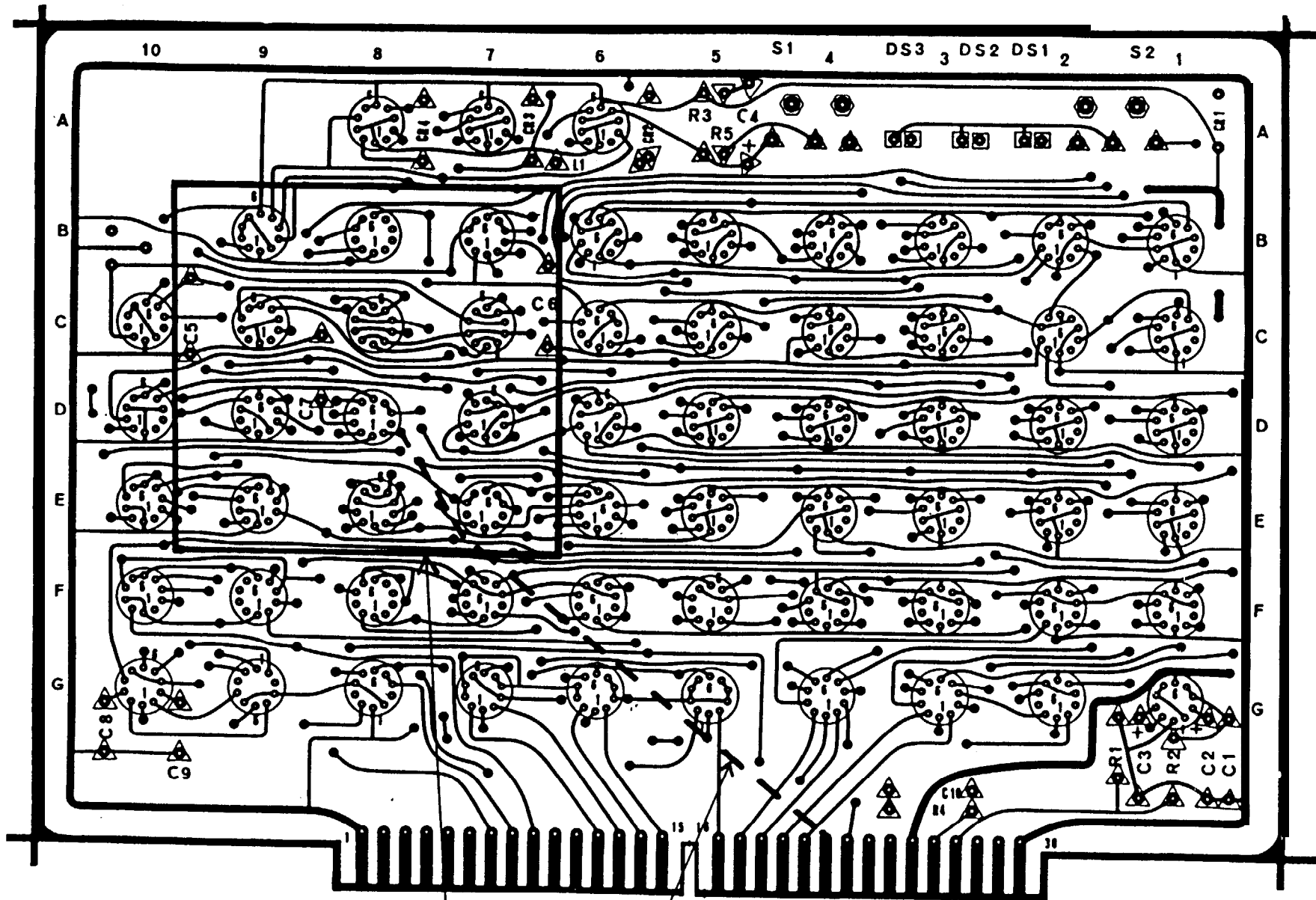
B. Schematics and/or Diagrams:

Make pen and ink changes to pages 2-79 and 2-195 per Figures 7 and 4, respectively.

C. Parts List:

None.

S007-1A2A14 Precipitation Accumulation Module

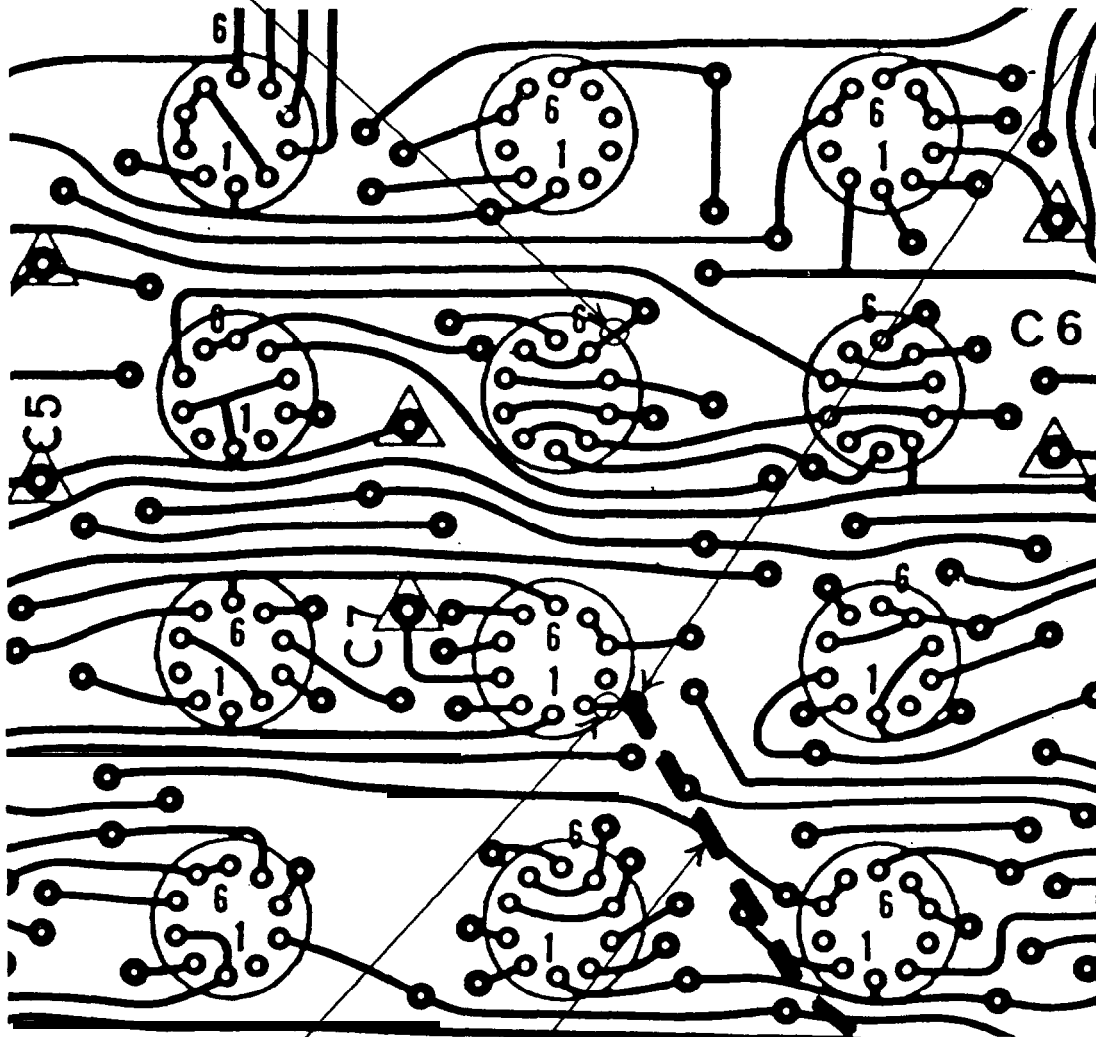


See Figure 2 for enlargement.

Insulated jumper to be installed
on component (other) side.

Cut land here.

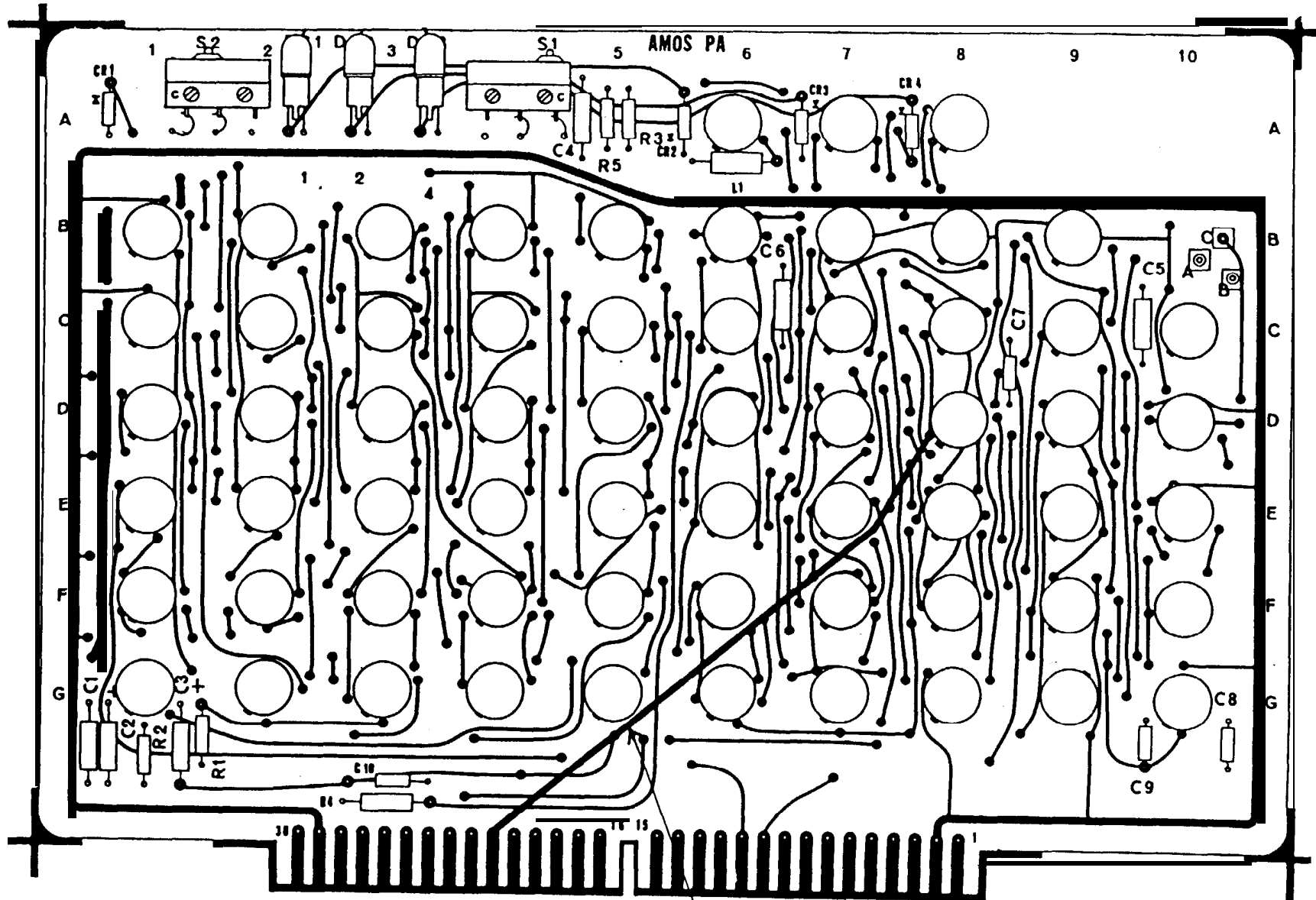
Feedthrough near 8D, pin 10.



Cut land here.

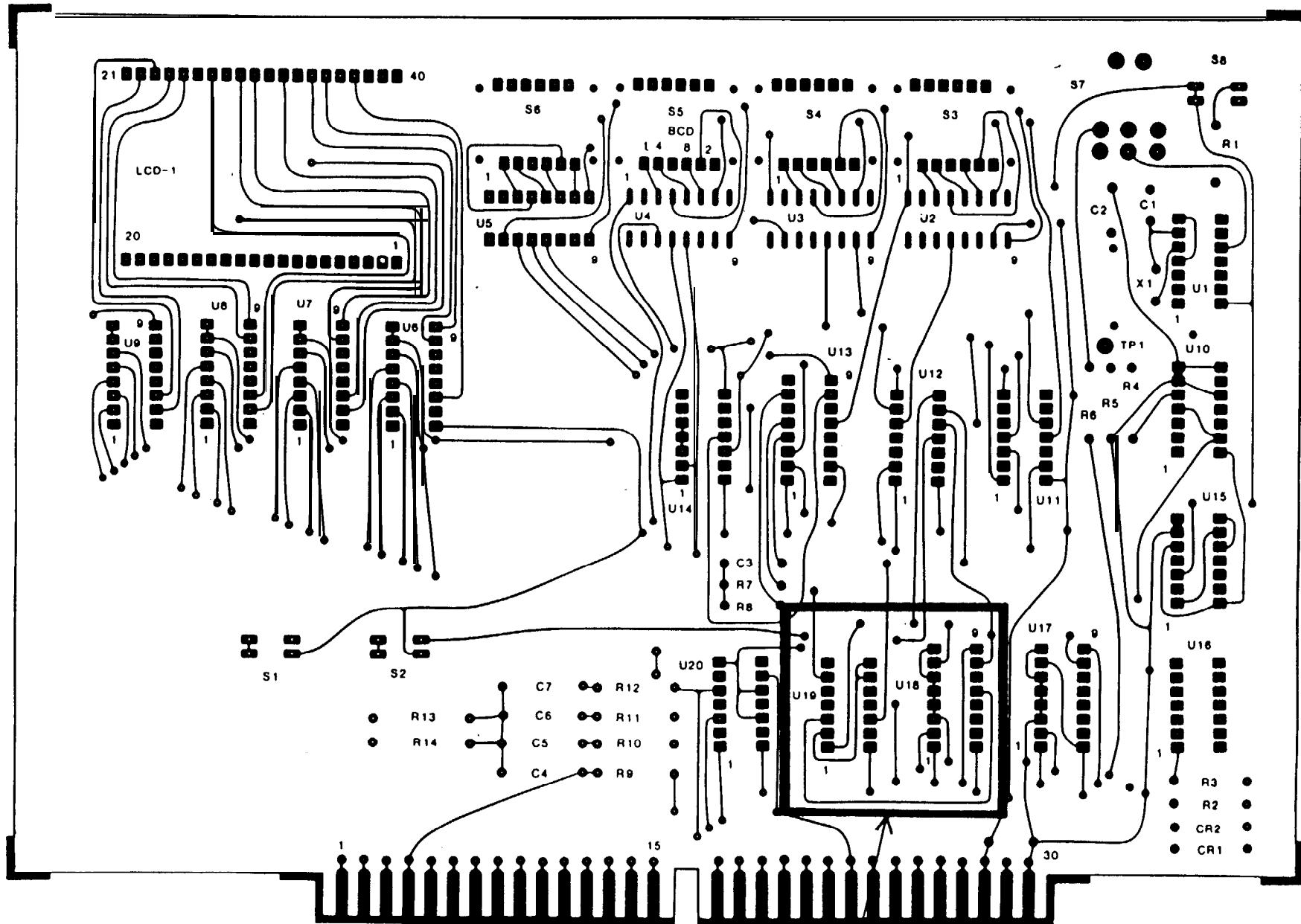
Insulated jumper to be installed
on component (other) side.

Enl argement of Preci pi tation Accumulation Modul e, ci rcui t si de



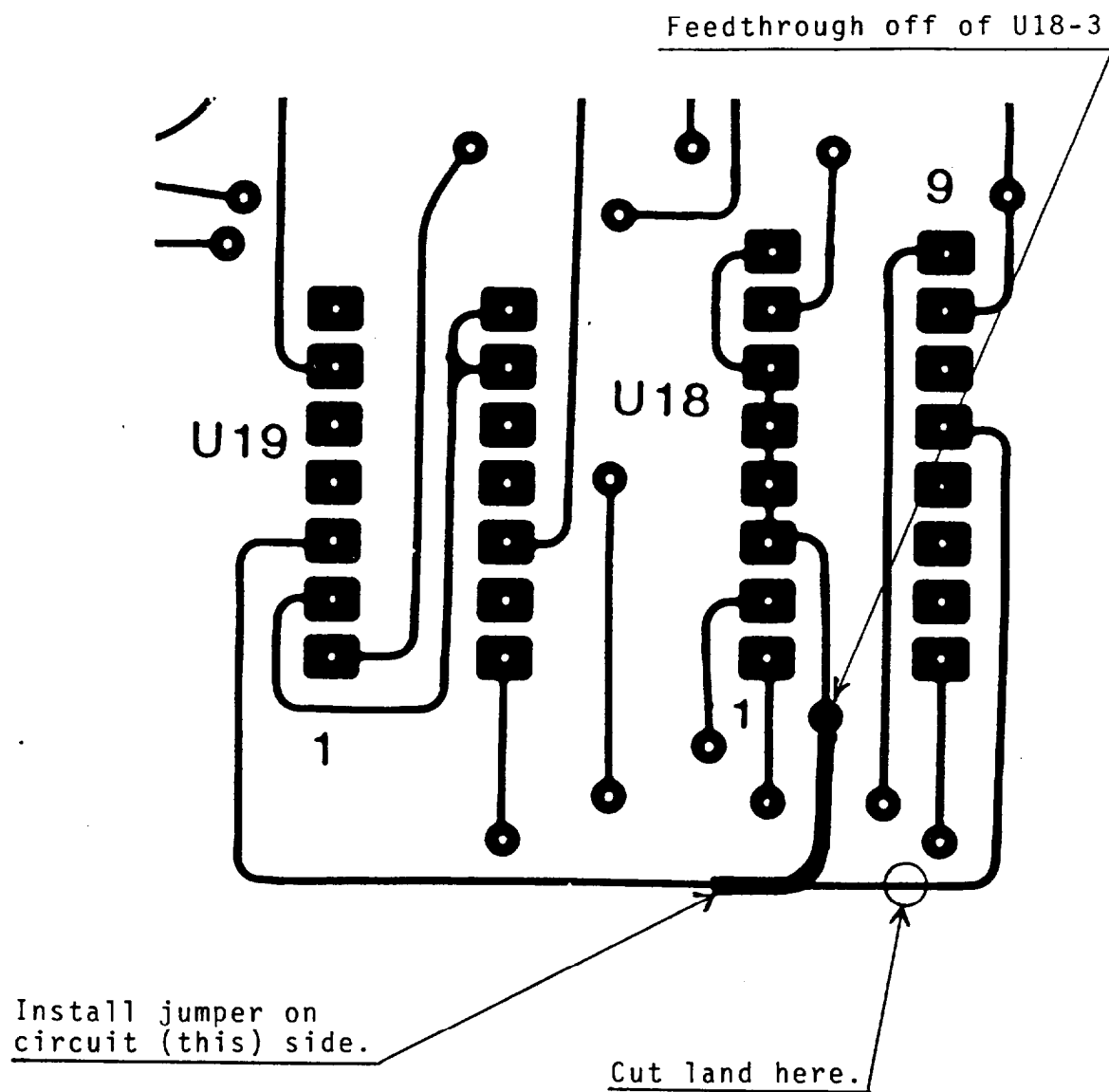
Insulated jumper to be installed
on component (this) side.

S007-1A2A1A Clock Module

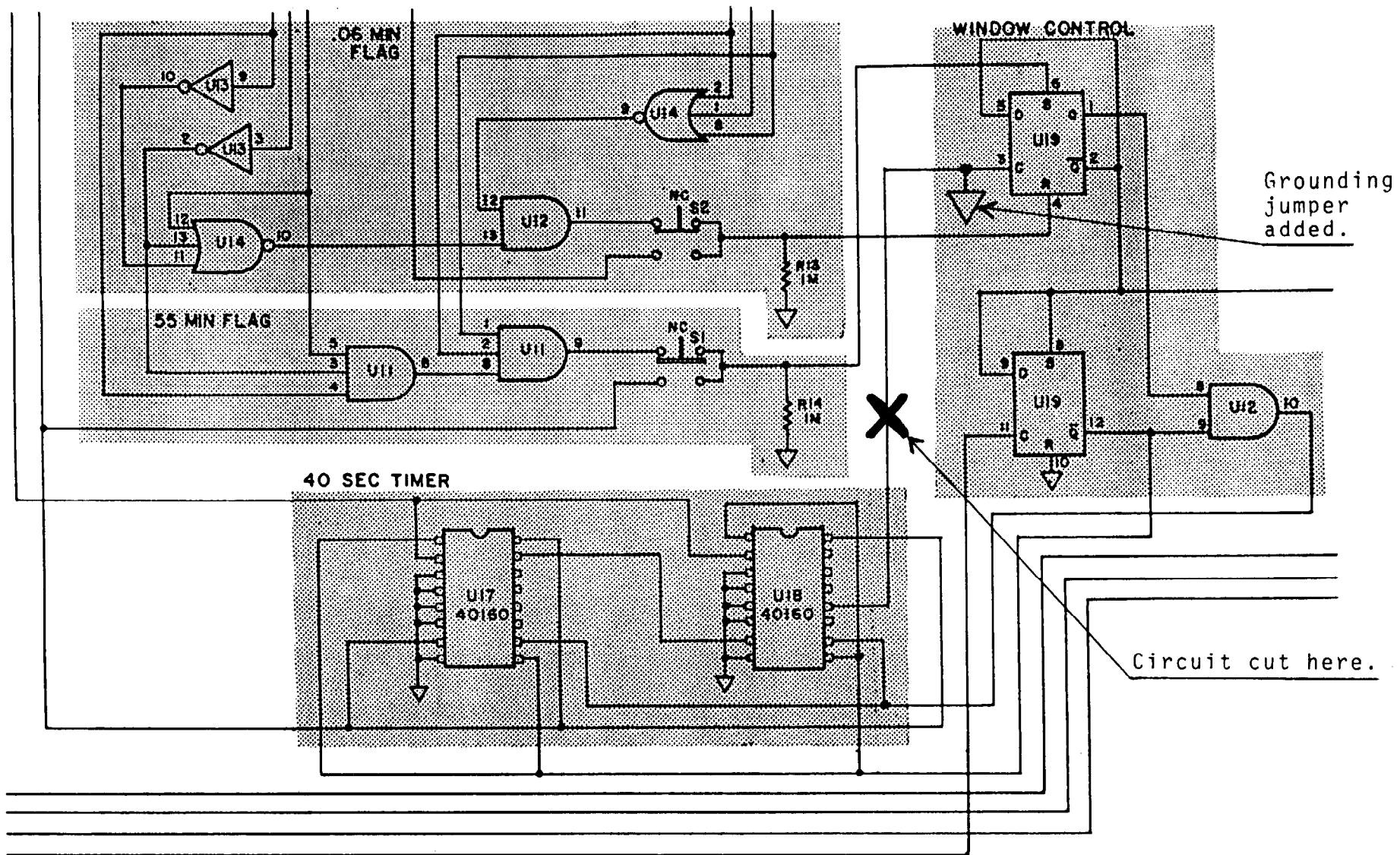


AMDS Modification #9 -- Figure 5.

See Figure 6 for enlargement.



Enlargement of new Clock Module, circuit side





U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

W/OTS13 - RCA

May 30, 1986

TO: All NWS Regional Headquarters, Area Electronics Supervisors, and
Electronics Technicians (EHB-11 Distribution)

FROM: J. Michael St. Clair *J. M. St. Clair*
Chief, Engineering Division

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11, Issuance 86-3

1. Material Transmitted:

Engineering Handbook No. 11, Automatic Observing Equipment, Section 3.2,
AMOS, Modification Note 10: Power-up Restart Correction.

2. Summary:

Modification Note 10 provides instructions for correcting a problem
discovered after AMOS Modification No. 7, Conversion to RS232C
Communications, was implemented. The AMOS was not consistently restarting
correctly after a power interruption. Modification 10 corrects the
deficiency. We thank Richard Cronkright of Galveston, Texas, for
reporting the problem.

3. Effect on Other Instructions

Inserts for AMOS Manual (11-103) are included with this modification note.

4. Certification Statement:

This modification has been tested for operational integrity by the
Operational Systems Engineering Branch and field checked at Galveston,
Texas.

5. Reporting Modification to WSH Engineering Division:

Target date for completion of this modification is June 30, 1986.

All completed equipment modifications shall be reported on the Form H-28
(see attached exhibit), Engineering Progress Report, according to
instructions contained in EHB-4, Part 2.

EHB-11
Issuance 86- 3



AMOS MODIFICATION NOTE 10
(For Electronics Technicians)

SUBJECT : Power-up Restart Correction

PURPOSE : To assure correct restart of the (RS232C) AMOS following a power interruption.

EQUIPMENT AFFECTED : AMOS's in all regions except Alaska and Pacific Regions; that is, all AMOS's which embraced AMOS Modification Note 7.

PARTS REQUIRED : 1 - EPROM, labeled AMOS U5, 3/24/86

MOD PROCUREMENT : All parts will be shipped directly to affected stations by NWS Headquarters.

SPECIAL TOOLS : None.

REQUI RED

TEST EQUIPMENT : None.

REQUI RED

TIME REQUIRED : 1 Work Hour

General:

Following the implementation of AMOS Modification 7, it was noticed that some AMOS's were not correctly restarting following a power interruption. In some cases the AMOS had to be powered down for several minutes to effect a proper restart. The associated loss of data and increased maintenance time was annoying and unacceptable. This modification corrects the deficiency.

Changes to the program stored in the EPROM include:

1. Register R6, the upper half of an address pointer, is now loaded before each and every call to subroutine MODEM.
2. The No-Action and Delay Timers previously shared register R14: the new version uses R14 for the Delay Timer and R10 for the No-Action Timer.

3. The AMOS is no longer reset upon exiting the HANGUP routine. The statement initializing the CALL register (SPH) has been relocated from the POWER-UP section to the NORESET section.
4. The HANGUP flag is cleared by the receipt of any character. The HANGUP flag location is changed from F1.4 (TMR.4) to P3.4.

Added, changed, and relocated statements are indicated by a vertical bar in the margin of the attached program listing.

PROCEDURE:

1. Turn off AMOS power.
2. Remove the 1A2A15C printed circuit board (PCB) and replace the EPROM (U5) with the new part provided. Note the serial number (85XX) on the 1A2A15C PCB.
3. Install the 1A2A15C PCB in the AMOS.
4. Turn on AMOS power and verify operation. Consult AMOS Modification Note 7 for details, if necessary.

This completes the modification.

Disposition of Removed Parts:

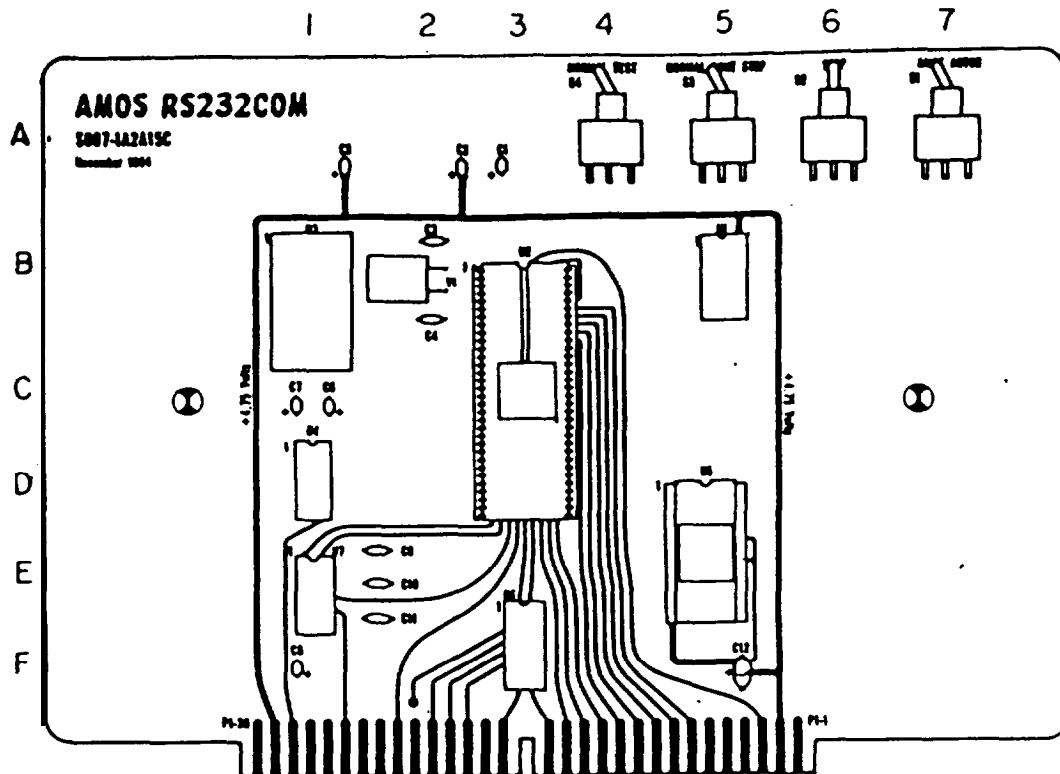
The removed EPROM is to be returned using the provided pre-addressed label. Please complete the provided return form and include it with the EPROM.

Instruction Manual Changes:

Replacement pages 2-248e through 2-2481 are provided with this modification note.

Attachments:

WS Form H-28 - Engineering Progress Report
AMOS Manual Pages 2-248e through 2-2481



1 A 2 A 1 5 C R S 2 3 2 C O M

REF DESIG	LOCATING COORD	NAME AND DESCRIPTION
U1	B/5	RESISTOR NETWORK, 15x10K, BECKMAN 16-2-103
U2	C/1	Z8 MICROCOMPUTER, ZILOG Z8612CS
U3	B/1	5V TO + 12V CONVERTER, PACKAGED POWER PM671
U4	D/1	QUAD LINE DRIVER, MOTOROLA MC1488P
U5	E/5	2Kx8 EPROM, NATIONAL MM2716Q
U6	F/3	SAME AS U1
U7	E/1	QUAD LINE RECEIVER, MOTOROLA MC1489AP
S1	A/7	SPDT TOGGLE SWITCH, C&K 7101MD9AB
S3	A/6	SPST PUSHBUTTON SWITCH, C&K 8121A
S4	A/5	SPST CENTER OFF TOGGLE SWITCH, C&K 7103MD9AB
	A/4	SAME AS S1
C1	A/2	CAPACITOR, 1 μ f, 35V
C2	A/2	SAME AS C1
C3	B/2	CAPACITOR, 15 pF, 1 KV
	B/2	SAME AS C3
C5	A/1	SAME AS C1
	C/1	SAME AS C1
C7	C/1	SAME AS C1
C8	F/1	SAME AS C1
C9	E/2	CAPACITOR, 470 pF, 1KV
C10	E/2	SAME AS C9
C11	E/2	SAME AS C9
C12	F/5	SAME AS C1
Y1	B/2	4.000 MHZ CRYSTAL, JAN CY3A

SOURCE FILE NAME: RS232C. ASM

AMOS MODIFICATION NO. 10: POWER-UP RESTART CORRECTION

```

; PORT ASSIGNMENTS :
; P0.0-3 BCD BUS
; P0.4 NOT USED
; P0.5 TEST SWITCH
; P0.6 MODE SWITCH, SINGLE-NOT
; P0.7 MODE SWITCH, NORMAL-NOT
; P1.0-4 BAUDOT BUS
; P1.5-7 NOT USED
; P2.0 BCD INHIBIT
; P2.1 1(J) INPUT
; P2.2 1 OUTPUT
; P2.3 RESET OUTPUT
; P2.4 SHIFT OUTPUT
; P2.5 DISPLAY CALL
; P2.6 CARRIER DETECT
; P2.7 AMOS/AUTOB_NOT SWITCH
; P3.0 SERIAL IN (IRQ3)
; P3.1 STEP PUSHBUTTON (IRQ2>
; P3.2 POWER ON (IRQ0)
; P3.3 HOUR-NOT (IRQ1-NOT USED>
; P3.4 HANG FLAG (USED INTERNALLY ONLY: ,
; P3.5 STEP FLAG (USED INTERNALLY ONLY>
; P3.6 THRE FLAG (USED INTERNALLY ONLY!
; P3.7 SERIAL OUT (IRQ4)
; REGISTER ASSIGNMENTS:
; R0-3 PORTS 0-3
; R4 SHIFT PULSE TIMER (255 MILLISECOND MAXIMUM>
; R5 BAUDOT CASE (LOOKUP TABLE OFFSET)
; RR6 MESSAGE POINTER
; RR8 CODE CONVERSION (BCD -> BAUDOT -> ASCII )
; R10 ONE MINUTE NO ACTION TIMER
; R11 QUARTERSECOND COUNTER (1 MINUTE MAXIMUM)
; R12 MILLISECOND COUNTER (250 MILLISECOND MAXIMUM)
; RI3 DEBOUNCE TIMER (255 MILLISECOND MAXIMUM)
; R14 DELAY TIMER (1 MINUTE MAXIMUM: ,
; RI5 FAILSAFE TIMER (1 MINUTE MAXIMUM: ,
; SPH CALL (PAST PORT 2)
0020 T EQU 20H ; TEST
0001 INH EQU 1 ; BCD INHIBIT
0008 R EQU 8 ; RESET
0010 SH EQU 10H ; SHIFT
0010 HANG EQU 10H ; HANGUP FLAG
0020 STEP EQU 20H ; STEP FLAG
0040 THRE EQU 40H ; TRANSMIT HOLDING REGISTER EMPTY
0000 0084 DW IRQ0 ; POWER ON
0002 000F DW IRQX ; NOT USED
0004 01EE DW IRQ2 ; STEP PUSHBUTTON
0006 0200 DW IRQ3 ; SERIAL IN
0008 0225 DW IRQ4 ; SERIAL OUT
000A 0229 DW IRQ5 ; ONE MILLISECOND
000C 8D0084 JP IRQ0
000F BF IRQX: IRET
```

SOURCE FILE NAME: RS232C. ASM

AMOS MODIFICATION NO. 10: POWER-UP RESTART CORRECTION

```
0010 3234204D VERSION: DE      " 24 MARCH 1986"
001D 00C50A41 LET:      DB      0, 197, 10, 65      ; NULL, E, LINEFEED, A
0021 A053C955          DB      160, 83, 201, 85      ; SPACE, S, I, U
0025 8D44D2CA          DB      141, 68, 210, 202      ; CAR. RET, D, R, J
0029 4EC6C34B          DE      78, 198, 195, 75      ; N, F, C, K
002D D45ACCD7          DB      212, 90, 204, 215      ; T, Z, L, W
0031 485950D1          DB      72, 89, 80, 209      ; H, Y, F, Q
0035 CF424700          DB      207, 66, 71, 0        ; O, B, G, (FIG. SHIFT)
0039 4DD85600          DB      77, 216, 86, 0        ; M, X, V, (LET. SHIFT)
003D 2D330A2D FIG:      DB      45, 51, 10, 45      ; -, 3, LINEFEED, -
0041 A087B8B7          DB      160 135 184 183      ; SPACE, BELL, 8, 7
0045 8D24B427          DB      141, 36, 80, 39      ; CAR. RET, $, 4, QUOTE
0049 AC213A28          DB      172, 33, 58, 40      ; COMMA, !, COLON, (
004D 352BA9B2          DB      53, 43, 169, 178      ; 5, +, ), 2
0051 A33630B1          DB      163, 54, 48, 177      ; #, 6, 0, 1
0055 393FA600          DB      57, 63, 166, 0        ; 9, ?, &, (FIG. SHIFT)
0059 2EAFBB00          DB      46, 175, 187, 0        ; PERIOD, /, SEMI, (LS)
005D 16171301 DIGIT:   DB      22, 23, 19, 1        ; 0, 1, 2, 3
0061 0A101507          DB      10, 16, 21, 7      ; 4, 5, 6, 7
0065 06180E1E          DB      6, 24, 14, 30      ; 8, 9, COLON, SEMI COLON
0069 0C03              DB      12, 3              ; COMMA, HYPHEN
006B 1C1D              DB      28, 29              ; PERIOD, SOLIDUS
006D 0802              CARRY: DB      8, 2              ; CARRIAGE RET, LINEFEED
006F 1F04              MSG:   DB      31, 4              ; LETTER SHIFT, SPACE
0071 031C1805 AMOS:    DB      3, 28, 24, 5          ; A, M, O, S
0075 04                DB      4                  ; SPACE
0076 1B                ONE:   DB      27              ; FIGURE SHIFT
0077                  DATA:  DB      0              ; AMOS DATA CHARACTERS
0077 04                QUIT:  DB      4              ; END OF TRANSMISSION
0078 00                DB      0              ; ONE SECOND GUARD TIME
0079 2B2B2B            DB      43, 43, 43          ; +++ ESCAPE CODE
007C 00                DB      0              ; ONE SECOND GUARD TIME
007D 00                QUIT1: DB      0              ; ONE SECOND EXEC TIME
007E 41D4488D          DB      65, 212, 72, 141      ; ATH(CR) HANGUP CODE
0082 0003              DB      0, 3              ; EXECUTION TIME, ETX
0084 E6F740            IRQ0:  LD      P3M, #40H      ; HI-Z PORT 2, PARITY OFF
0087 E6F84D            LD      P01M, #04DH          ; MAKE PORTS 0 & 1 INPUTS
008A E6FF80            LD      SPL, #80H            ; STACK POINTER
008D B0FC              CLR     FLAGS              ; CLEAR FLAGS
008F E6FB3F            LD      IMR, #3FH           ; UNMASK ALL INTERRUPTS
0092 B0FA              CLR     IRQ              ; CLEAR INTERRUPT REQS
0094 E6F90E            LD      IPR, #0EH           ; PRIORITY IRQ5, 3, 0, 2, 4, 1
0097 E6F6E3            LD      P2M, #0E3H          ; PORT 2 I/O, BCD INH. IN
009A E6F511            LD      PRE0, #11H          ; MOD 4 -> 8 MICROSECONDS
009D E6F447            LD      T0, #71             ; MOD 71 -> 568 MICROSECS
00A0 E6F317            LD      PRE1, #17H          ; MOD 5 -> 10 MICROSECS
00A3 E6F264            LD      T1, #100            ; MOD 100 -> 1 MILLISEC
00A6 E6F10F            LD      TMR, #0FH          ; LOAD & ENABLE TIMERS
```

SOURCE FILE NAME: RS232C. ASM

AMOS MOD IF I CAT I ON NO. 10: POWER-UP RESTART CORRECTION

00A9	3100		SRP	#0	
00AB	3C40		LD	R3, #THRE	; INITIALIZE PORT 3 FLAGS
00AD	8C00		LD	R8, #HIGH LET	; INITIALIZE TABLE PTR
00AF	DCFA		LD	R13, #250	; INITIALIZE DEBOUNCER
00B1	9F		EI		; ENABLE ALL INTERRUPTS
00B2	6C00		LD	R6, #HIGH QUIT1	; SET MODEM BAUD RATE
00B4	7C7D		LD	R7, #LOW QUIT1	
00B6	D601E6		CALL	MODEM	
00B9	2C08	RESET:	LD	R2, #R	; SET RESET
00BB	E6F6E2	NORESET:	LD	P2M, #0E2H	; BCD INHIBIT OUTPUT
00BE	E6F741		LD	P3M, #41H	; PORT 2 ACTIVE
00C1	56E2EB		AND	R2, #NOT(SH OR 4)	; CLEAR SHIFT & 10UT
00C4	46E201		OR	R2, #INH	; SET BCD INHIBIT
00C7	29FE		LD	SPH, R2	; INITIALIZE CALL
00C9	6C00		LD	R6, #HIGH MSG	; INITIALIZE MESSAGE PTR
00CB	7C6F		LD	R7, #LOW MSG	
00CD	8216		LDE	R1, @RR6	; INITIALIZE BAUDOT BUS
00CF	E6F845		LD	P01M, #45H	
00D2	FC28	FLLOAD:	LD	R15, #40	; LOAD WITH 10 SECONDS
00D4	72FF	FLTEST:	TM	R15, R15	; IF FAILSAFE TIMER IS 0,
00D6	6BE1		JR	Z, RESET	; THEN RESET
00D8	76E208		TM	R2, #R	; IF TRANSMITTING,
00DB	6B40		JR	Z, RUN	; SKIP TO RUN
00DD	76FE40		TM	SPH, #40H	; IF NO CARRIER,
00E0	EB1C		JR	NZ, REQ	; SKIP TO REQ
00E2	76E020		TM	R0, #T	; IF NOT TEST MODE,
00E5	EB04		JR	NZ, HANGUP	
00E7	72AA		TM	R10, R10	; AND NO ACTION,
00E9	6B05		JR	Z, HANGUP1	
00EB	76E310	HANGUP :	TM	R3, #HANG	; OR IF HANGUP FLAG SET,
00EE	6B0E		JR	Z, REQ	
00F0	6C00	HANGUP 1:	LD	R6, #HIGH QUIT	; THEN HANGUP SEQUENCE
00F2	7C77		LD	R7, #LOW QUIT	
00F4	D601E6		CALL	MODEM	
00F7	56E3EF		AND	R3, #NOT HANG	; CLEAR HANGUP FLAG
00FA	29FE		LD	SPH, R2	; UPDATE CALL
00FC	8BB0		JR	NORESET	; GO TO NORESET
00FE	72DD	REQ:	TM	R13, R13	; AND IF DEBOUNCED,
0100	EBD0		JR	NZ, FLLOAD	
0102	A4E2FE		CP	SPH, R2	; AND, IF PORT 2 CHANGED,
0105	6BCB		JR	EQ, FLLOAD	
0107	DCFA		LD	R13, #250	; RELOAD DEBOUNCER
0109	70E2		PUSH	R2	; COMPUTE P2 NEG. TRAN.
010B	60FE		COM	SPH	
010D	45FFFE		OR	SPH, @SPL	
0110	E4FEFC		LD	FLAGS, SPH	
0113	50FE		POP	SPH	
0115	DB06		JR	PL, RUN	; JUMP IF DISPLAY CALL
0117	6BB9		JR	Z, FLLOAD	; JUMP IF NO CAR. DET.
0119	ACF0		LD	R10, #240	; LOAD NO-ACTION TIMER
011B	8BB5		JR	FLLOAD	; GO TO FLLOAD

SOURCE FILE NAME: RS232C.ASM

AMOS MODIFICATION NO. 10: POWER-UP RESTART CORRECTION

```
011D 56E2F7      RUN:      AND      R2, #NOT R      ; CLEAR RESET
0120 ACFO                LD      R10, #240      ; MINUTE NO-ACTION TIMER
0122 76E320                TM      R3, #STEP      ; IF NOT STEPPED,
0125 EB06                JR      NZ, FETCH
0127 09FC                LD      FLAGS, R0      ; AND IN SINGLE STEP,
0129 6B02                JR      Z, FETCH      ; AND IN TEST MODE,
012B 5BA5                JR      MI, FLLOAD      ; THEN GO TO FLLOAD
012D 56E3DF      FETCH:    AND      R3 #NOT STEP      ; CLEAR STEP FLAG
0130 98E1                LD      R9: R1      ; FETCH BAUDOT BUS CHAR.
0132 56E91F                AND      R9, #1FH
0135 A6E91F                CP      R9, #31      ; IF LETTER SHIFT,
0138 EB04                JR      NE, FETCH1
013A 5C1D                L D      R5, #LOW LET      ; LOAD LETTERS OFFSET
0131 8B17                JR      NEXT      ; GET NEXT CHARACTER
013E A6E91B      FETCH 1:  CP      R9, #27      ; IF FIGURE SHIFT,
0141 EB04                JR      NE, XMIT
0143 5C3D                LD      R5, #LOW FIG      ; LOAD FIGURES OFFSET
0145 8B0E                JR      NEXT      ; GET NEXT CHARACTER
0147 76E340      XMIT:    TM      R3, #THRE      ; WAIT FOR THRE
014A 6BFB                J R      Z, XMIT
014C 0295                ADD      R9, R5      ; ADD TABLE OFFSET
014E 8298                LDE      R9, @RR8      ; FETCH ASCII CODE
0150 56E3BF                AND      R3, #NOT THRE      ; CLEAR THRE
0153 99F0                LD      SI0, R9      ; LOAD UART
0155 76E202      NEXT:    TM      R2, #2      ; IF 1(J) INPUT,
0158 6B04                JR      Z, NEXT1
015A 7C6D                LD      R7, #LOW CARRY      ; POINT TO CARRY
015C 8B20                JR      INTERN      ; SKIP TO INTERN
015E 7E                NEXT1:  INC      R7      ; INCREMENT MSG PTR
015F A6E777                CP      R7, #LOW DATA      ; IF TWC CHARACTER,
0162 9B24                JR      GE, EXTERN
0164 A6E771                CP      R7, #LOW AMOS      ; IF A IN AMOS,
0167 EB0A                JR      NE, NEXT2      ; AND IF AUTOB,
0169 76E280                TM      R2, #80H
016C EB10                JR      NZ, INTERN
016E 06E705                ADD      R7, #5      ; SKIP OVER AMOS
0171 8B0B                JR      INTERN      ; SKIP TO INTERN
0173 A6E76F      NEXT2:    CP      R7, #LOW MSG      ; IF NOT END OF MESSAGE
0176 EB06                JR      NE, INTERN      ; THEN SKIP TO INTERN
0178 66E0E0                TCM      R0, #0EOH      ; IF NOT CONTINUOUS MODE,
017B ED00BS                J P      NZ, RESET      ; THEN RESET
017E 8216                INTERN: LDE      R1, @RR6      ; FETCH TC: CHARACTER
0180 D60186                CALL     SHI FT      ; OUTPUT SHI FT PULSE
0183 E6F6E2                LD      P2M, #0E2H      ; OUTPUT BCD INHI BIT
0186 8B1F                JR      BUSOUT      ; SKIP TO BUSOUT
```

SOURCE FILE NAME: RS232C.ASM

AMOS MODIFICATION NO. 10: POWER-UP RESTART CORRECTION

```
0188 7C77      EXTERN:  LD      R7, #LOW DATA      ; KEEP MSG PTR @ DATA
018A E6F6E3      LD      P2M, #0E3H      ; IF DATA, BCD INHIBIT IN
018D E6F84D      LD      P01M, #4DH      ; INPUT BAUDOT BUS
0190 D601B6      CALL     SHI FT      ; OUTPUT SHI FT PULSE
0193 4C02      LD      R4, #2      ; PROPAGATION DELAY
0195 7244      PROPDY:  TM      R4, R4
0197 EBFC      JR      NZ, PROPDY
0199 76E201      TM      R2, #INH      ; IF BCD INHIBIT,
019C EBOC      JR      NZ, MODE      ; SKIP TO MODE
019E 9C0F      LD      R9, #OFH      ; IF NOT BCD INHIBIT,
01A0 5290      AND      R9, R0      ; INPUT, MASK BCD BUS
01A2 06E95D      ADD      R9, #LOW DIGIT      ; ADD DIGIT OFFSET
01A5 8218      LDE      R1, @RR8      ; FETCH BAUDOT CODE
01A7 E6F845      BUSOUT: LD      P01M, #45H      ; OUTPUT BAUDOT BUS
01AA D601B9      MODE :  CALL     SHI FT1      ; BETWEEN PULSES DELAY
01AD 76E020      TM      R0, #T      ; IF IN TEST MODE,
01B0 ED00D2      JP      NZ, FLLOAD      ; RELOAD FAILSAFE
01B3 8D00D4      JP      FLTEST      ; GO TEST FAILSAFE TIMER
01B6 46E210      SHI FT:  OR      R2, #SH      ; SHI FT HIGH
01B9 4C04      SHI FT1: LD      R4, #4      ; WAIT 4 MILLI SECONDS
01BB 7244      SHI FT2:  TM      R4, R4
01BD EBFC      JR      NZ, SHI FT2
01BF 9CEB      LD      R9, #NOT(SH OR 4)      ; CLEAR SHI FT & 1 OUTPUT
01C1 5292      AND      R2, R2
01C3 A6E776      CP      R7, #LOW ONE      ; IF TIME FOR 1 OUTPUT,
01C6 EB03      JR      NE, SHI FT3      ;
01C8 46E904      OR      R9, #4      ; SET 1 OUTPUT
01CB 28E9      SHI FT3:  LD      R2, R9
01CD AF      RET
01CE A6E900      MODEM1: CP      R9, #0      ; IF NULL CODE,
01D1 EB08      JR      NE, MODEM3      ;
01D3 EC05      LD      R14, #5      ; WAIT ONE SECOND
01D5 72EE      MODEM2:  TM      R14, R14
01D7 EBFC      JR      NZ, MODEM2
01D9 8B0A      JR      MODEM4      ; SKIP TO MODEM4
01DB 76E340      MODEM3: TM      R3, #THRE      ; WAIT FOR THRE
01DE 6BFB      JR      Z, MODEM3
01E0 56E3BF      AND      R3, #NOT THRE      ; CLEAR THRE
01E3 99F0      LD      SI 0, R9      ; LOAD UART
01E5 7E      MODEM4 :  INC      R7      ; INCREMENT CODE PTR
01E6 8296      MODEM :  LDE      R9, @RR6      ; FETCH MODEM CODE
01E8 A6E903      CP      R9, #3      ; IF END OF CODE STRING,
01EB EBE1      JR      NE, MODEM1
01ED AF      RET      ; THEN RETURN
```

SOURCE FILE NAME: RS232C.ASM

AMOS MODIFICATION NO. 10: POWER-UP RESTART CORRECTION

```
01EE 76E020      IRQ2:  TN      R0, #T      ; IF IN TEST MODE,
01F1 6B0C        JR      Z, IRQ21
01F3 72DD        TM      R13, R13      ; AND IF DEBOUNCED,
01F5 EB08        JR      NZ, IRQ21
01F7 DCFA        LD      R13, #250      ; RELOAD DEBOUNCER
01F9 46E320      OR      R3, #STEP      ; SET STEP FLAG
01FC 56E2F7      AND     R2, #NOT R      ; CLEAR RESET
01FF BF          IRQ21:  IRET
0200 ACFO        IRQ3:  LD      R10, #240      ; MINUTE NO-ACTION TIMER
0202 56E3EF      AND     R3, #NOT HANG      ; CLEAR HANGUP FLAG
0205 A6F01B      CP      SI0, #27      ; IF RECEIVED = ESC,
0208 6B05        JR      EQ, IRQ31
020A A6F09B      CP      SI0, #27+128
020D EB03        JR      NE, IRQ32
020F 46E310      IRQ31:  OR      R3, #HANG      ; SET HANGUP FLAG
0212 76E020      IRQ32:  TM      R0, #T      ; IF NOT IN TEST,
0215 EB0D        JR      NZ, IRQ34
0217 A6F04F      CP      SI0, #'0'      ; AND IF RECEIVED = 0,
021A 6B05        JR      EQ, IRQ33
021C A6F0CF      CP      SI0, #'0' +128
021F EB03        JR      NE, IRQ34
0221 56E2F7,     IRQ33:  AND     R2, #NOT R      ; CLEAR RESET
0224 BF          IRQ34:  IRET
0225 46E340      IRQ4:  OR      R3, #THRE      ; SET THRE
0228 BF          IRET
0229 7244        IRQ5:  TM      R4, R4      ; DECREMENT NZ SHIFT TMR
022B 6B02        JR      Z, IRQ51
022D 00E4        DEC     R4
022F 72DD        IRQ51:  TM      R13, R13      ; DECREMENT NZ DEBOUNCER
0231 6B02        JR      Z, IRQ52
0233 00ED        DEC     R13
0235 CE          IRQ52:  INC     R12      ; INCR MILLI SECOND CTR
0236 A6ECFA      CP      R12, #250      ; CORRECT FOR OVERFLOW
0239 EB1C        JR      NE, IRQ56
023B B0EC        CLR     R12
023D BE          INC     R11      ; INCR QUARTERSECOND CTR
023E A6EBF0      CP      R11, #240      ; CORRECT FOR OVERFLOW
0241 EB02        JR      NE, IRQ53
0243 B0EB        CLR     R11
0245 72EE        IRQ53:  TM      R14, R14      ; DECREMENT NZ DELAY TMR
0247 6B02        JR      Z, IRQ54
0249 00EE        DEC     R14
024B 72FF        IRQ54:  TM      R15, R15      ; DECREMENT NZ FAILSAFE
024D 6B02        JR      Z, IRQ55
024F 00EF        DEC     R15
0251 72AA        IRQ55:  TM      R10, R10      ; DECREMENT NZ NO-ACTION
0253 6B02        JR      Z, IRQ56
0255 00EA        DEC     R10
0257 BF          IRQ56:  IRET
0000             END
```

SOURCE FILE NAME: RS232C.ASM

---- SYMBOL TABLE ----

AMOS	0071	IRQ33	0221	P3M	00F7
BUSOUT	01A7	IRQ34	0224	PRE0	00F5
CARRY	006D	IRQ4	0225	PRE1	00F3
DATA	0077	IRQ5	0229	PROPDY	0195
DIGIT	005D	IRQ51	022F	QUIT	0077
EXTERN	0188	IRQ52	0235	QUIT1	007D
FETCH	012D	IRQ53	0245	R	0008
FETCH1	013E	IRQ54	024B	REQ	00FE
FIG	003D	IRQ55	0251	RESET	00B9
FLAGS	00FC	IRQ56	0257	RUN	011D
FLLOAD	00D2	IRQX	000F	SH	0010
FLTEST	00D4	LET	001D	SHIFT	01B6
HANG	0010	MODE	01AA	SHIFT1	01B9
HANGUP	00EE	MODEM	01E6	SHIFT2	01BB
HANGUP1	00F0	MODEM1	01CE	SHIFT3	01CB
IMR	00FB	MODEM2	01D5	SIO	00F0
INH	0001	MODEM3	01DB	SPH	00FE
INTERN	017E	MODEM4	01E5	SPL	00FF
IPR	00F9	MSG	006F	STEP	0020
IRQ	00FA	NEXT	0155	T	0020
IRQ0	0084	NEXT1	015E	T0	00F4
IRQ2	01EE	NEXT2	0173	T1	00F2
IRQ21	01FF	NORESET	00BB	THRE	0040
IRQ3	0200	ONE	0076	TMR	00F1
IRQ31	020F	P01M	00F8	VERSION	0010
IRQ32	0212	P2M	00F6	XMIT	0147



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

W/OTS14 - WDH

August 15, 1986

TO: All NWS Regional Headquarters, Area Electronics Supervisors, and
Electronics Technicians (EHB-11 Distribution)

FROM: W/OTS1 - J. Michael St. Clair *J. M. St. Clair*

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 11, Issuance 86-4

1. Material Transmitted:

Engineering Handbook No. 11, Automatic Observing Equipment, Section 3.2,
AMOS, Modification Note 11: Oki data Microline 182S Printer Installation.

2. Summary:

Modification Note 11 provides instructions for installing the Oki data
Microline 182S Printer in the AMOS equipment.

3. Effect on Other Instructions

None.

4. Certification Statement:

This modification has been tested for operational integrity by the
Operational Systems Engineering Branch.

5. Reporting Modification to WSH Engineering Division:

Target date for completion of this modification is 30 days after receipt.

All completed equipment modifications shall be reported on the Form H-28,
Engineering Progress Report, according to instructions contained in EHB-4,
Part 2, using equipment code AMOS or AUTOB, as appropriate.

EHB-11
Issuance 86-4



AMOS MODIFICATION NOTE 11
(For Electronics Technicians)

SUBJECT: Oki data Microline 182S Printer Installation

PURPOSE: To permit local display of AMOS data for information and maintenance purposes.

EQUIPMENT AFFECTED: AUTOB's and non-MED AMOS's in all regions except Alaska.

PARTS REQUIRED:

- 1 - Oki data Microline 182S Printer
- 1 - Printer Connecting Cable
- Printer paper (procure locally)

MOD PROCUREMENT: Parts will be shipped by NWS Headquarters to affected stations which have installed AMOS Modifications 7 and 10.

SPECIAL TOOLS REQUIRED: None.

TEST EQUIPMENT REQUIRED: None.

TIME REQUIRED: 2 Work Hours

General:

Before Service A was removed, the teletype provided a local display of the AMOS data. When Service A was removed, the teletype was removed with it. This modification provides a RS232C printer to replace the lost function.

Procedure:

1. The AMOS is polled by CADAS at 20-minute intervals. Time your actions during the installation of this modification, so as not to interfere with the CADAS data collection.
2. Instructions for unpacking and installing the printer are contained in the printer handbook which is located beneath the printer. Read Chapter 1 in the handbook before completely unpacking or installing the printer.

3. Find the 4 1/2 foot gray connecting cable. (If the printer will not be located adjacent to the AMOS rack, then you may need a longer cable. The cable may be extended up to a distance of 50 feet.) The cable spade lugs may be attached to the AMOS at either TB102 (at the rear of the processor chassis) or TB3 (at the base of the rack). The green wire is connected to pin 7 of the DB25P connector. It is the signal ground. Connect this green wire to TB102-3 (or TB3-5). The red wire is connected to pin 3 of the DB25P connector. It is the received data. Connect this wire to TB102-2 (or TB3-2). Do not connect the DB25P connector to the printer until called for in Step 8.
4. Unpack and self-test the printer per the instructions on pages 3 through 9 of the printer handbook.
5. Set the internal control board switches per the instructions on pages 15 through 18 of the printer handbook. The factory setting of these switches (1-8) are: On, Off, Off, Off, On, Off, On, Off, respectively. The following changes are recommended:
 - a. Change Switch 1 to Off to have the character zero printed with a slash through it.
 - b. Change Switch 6 to On if double-spacing of the AMOS messages is desired.

The settings of the control board Switches 1-8 should be:
Off, Off, Off, Off, On, On or Off, On, Off, respectively.
6. Set the internal serial board switches per instructions on pages 72-73 of the printer handbook. The factory settings of these switches 1-8 are: Off, Off, Off, On, Off, On, Off, Off, respectively. Switch 4 must be changed to Off to operate the printer at 110 baud. The settings of the serial board switches 1-8 should be: Off, Off, Off, Off, Off, On, Off, Off, respectively.
7. Replace the switch cover removed in Step 5.
8. Turn the printer off. Connect the (signal) cable per instructions on pages 12-13 of the printer handbook.

This completes the modification procedure.

Operation:

When the equipment (AMOS and printer) is on, the AMOS data will be printed each time the AMOS is polled. This usually occurs once every 20 minutes, but can occur more often if users other than CADAS call the AMOS.

The AMOS may be polled locally for maintenance or calibration. It is suggested that the Hayes Smartmodem be disconnected when polling locally. Local polling may be achieved using the switches atop the AMOS RS232COM PWB (S007-1A2A15C). Their operation is described on page 2-248a of the AMOS manual.

During calibration it may be desirable to remove the access cover of the printer to see the data better. It is recommended that you keep the access cover in place, except during calibration, to minimize the accumulation of dust inside the printer.

Due to the expanding use of personal computer technology, the printer is subject to theft. Take the necessary measures to secure the printer. It is suggested that the printer be firmly secured and fastened in position. An alternative is to store the printer in a locked cabinet when not in use.

Supplies and repairs to the printer are to be obtained locally as the printer chosen is widely available. At this time there are no plans to stock parts or supplies at NLSC.

Attachments:

WS Form H-28 - Engineering Progress Report
AMOS Manual Page 2-248a

AMOS III-73 Manual (11-103) Inserts

These inserts are Change 15 to the AMOS manual. Change 15 documents AMOS Modification No. 12, the S007-1A2A16A Service Module.

The following page should be inserted into the AMOS manual, volume 2, between pages 2-228 and 2-229:

2-228B (2-228A BLANK)	Keyed Text
2-228C (2-228D BLANK)	Schematic
2-228E (2-228F BLANK)	Parts Location and List

Pen-and-ink entries should be made on page B, Record of Changes, in both volumes 1 and 2.

1A2A16A SERVICE

Used to substitute for malfunctioning Processor printed circuit boards (with exception of Clock and Teletype printed circuit boards). Insertion into Processor will result in letter M, and slant mark (/) or space being printed out in place of normal data. The slant mark (/) or space are selected by the use of switch S1. The 1 IN input is the 1 OUT output of the previous printed circuit board in the card file. The 1 OUT output is the interrogation signal to the next printed circuit board in the card file.

1 POWER

Distributes +4.75V power to the 1A2A16A service printed circuit board.

2 SHIFT REGISTER

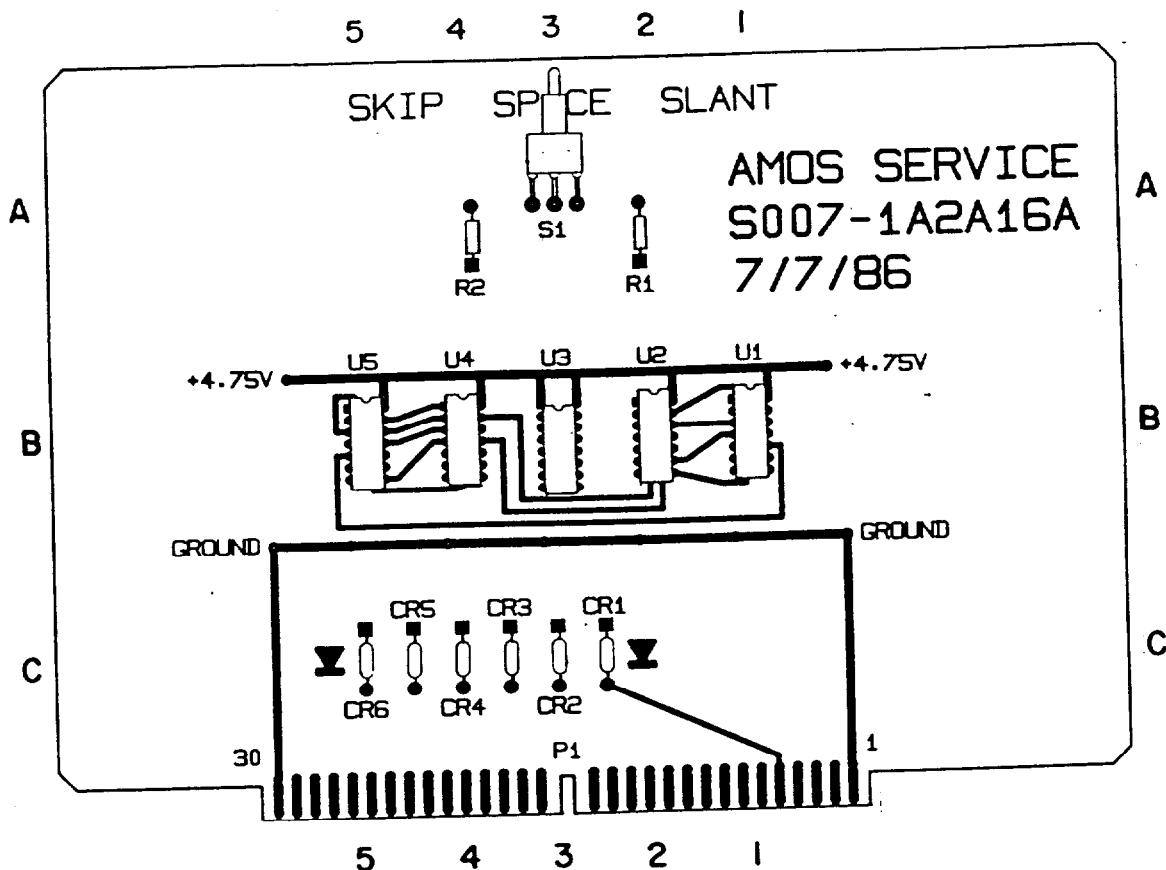
Sets up format and controls output signal from the Baudot Coder. Gate U2-B causes the Shift Register to shift on the trailing edge of the SHIFT pulse. When RESET is high, the shift register will be reset (All Q outputs low). When the 1 IN input goes high, the LETTERS output of U3-A will be set high. The next high SHIFT pulse will toggle LETTERS low, which in turn toggles U3-A M output high. Succeeding SHIFT pulses will step these highs to FIGURES and 4TH CHARACTER.

3 MANUAL INPUT

Permits manual selection of SLANT, SPACE, or SKIP as teletype output. It also determines whether the 1 OUT output is produced with the third character (FIGURES) or the fourth character (SPACE or SLANT). When S1 is in SPACE position, gate U2-D will be enabled, causing the Baudot Coder to produce the 1 OUT output and a baudot code for space (M3 only). When S1 is in the SLANT position, gates U1-C and U2-D will be enabled, causing the Baudot Coder to produce the 1 OUT output and a baudot code for slant (M1, M3, M4, M5). When S1 is in the SKIP position, gate U2-C will be enabled, causing the 1 OUT output to be produced with the FIGURES character.

4 BAUDOT CODER

Codes the inputs from the Shift Register and Manual Input to a Baudot output.



1A2A16A SERVICE

R E F DESIG.	LOCATING COORD.	NAME AND DESCRIPTION
CR1	C / 3	DIODE, 1N914
CR2	C / 3	DIODE, 1N914
CR3	C / 4	DIODE, 1N914
CR4	C / 4	DIODE, 1N914
CR5	C / 5	DIODE, 1N914
CR6	C / 5	DIODE, 1N914
R1	A / 2	RESISTOR, 100K OHM 5%, 1/4 WATT
R2	A / 4	RESISTOR, 100K OHM, 5%, 1/4 WATT
S1	A / 3	SWITCH, TOGGLE, SPDT CENTER OFF, C&K 7103
U1	B / 1	QUAD 2- INPUT NOR GATE, RCA CD4001BE
U2	B / 2	QUAD 2- INPUT NOR GATE, RCA CD4001BE
U3	B / 3	DUAL 4- STAGE SHIFT REGISTER, RCA CD4015BE
U4	B / 4	TRIPLE 3- INPUT OR GATE, RCA CD407BE
U5	B / 5	TRIPLE 3- INPUT OR GATE, RCA CD4075BE

1A2A16A SERVICE 2-228C/ (2-228D BLANK)

AMOS III-73 Manual (11-103) Inserts

These inserts are Change 15 to the AMOS manual. Change 15 documents AMOS Modification No. 12, the S007-1A2A16A Service Module.

The following page should be inserted into the AMOS manual, volume 2, between pages 2-228 and 2-229:

2-228B	(2-228A BLANK)	Keyed Text
2-228C	(2-228D BLANK)	Schematic
2-228E	(2-228F BLANK)	Parts Location and List

Pen-and-ink entries should be made on page B, Record of Changes, in both volumes 1 and 2.

1A2A16A SERVICE

Used to substitute for malfunctioning Processor printed circuit boards (with exception of Clock and Teletype printed circuit boards). Insertion into Processor will result in letter M, and slant mark (/) or space being printed out in place of normal data. The slant mark (/) or space are selected by the use of switch S1. The 1 IN input is the 1 OUT output of the previous printed circuit board in the card file. The 1 OUT output is the interrogation signal to the next printed circuit board in the card file.

① POWER

Distributes +4.75V power to the 1A2A16A service printed circuit board.

② SHIFT REGISTER

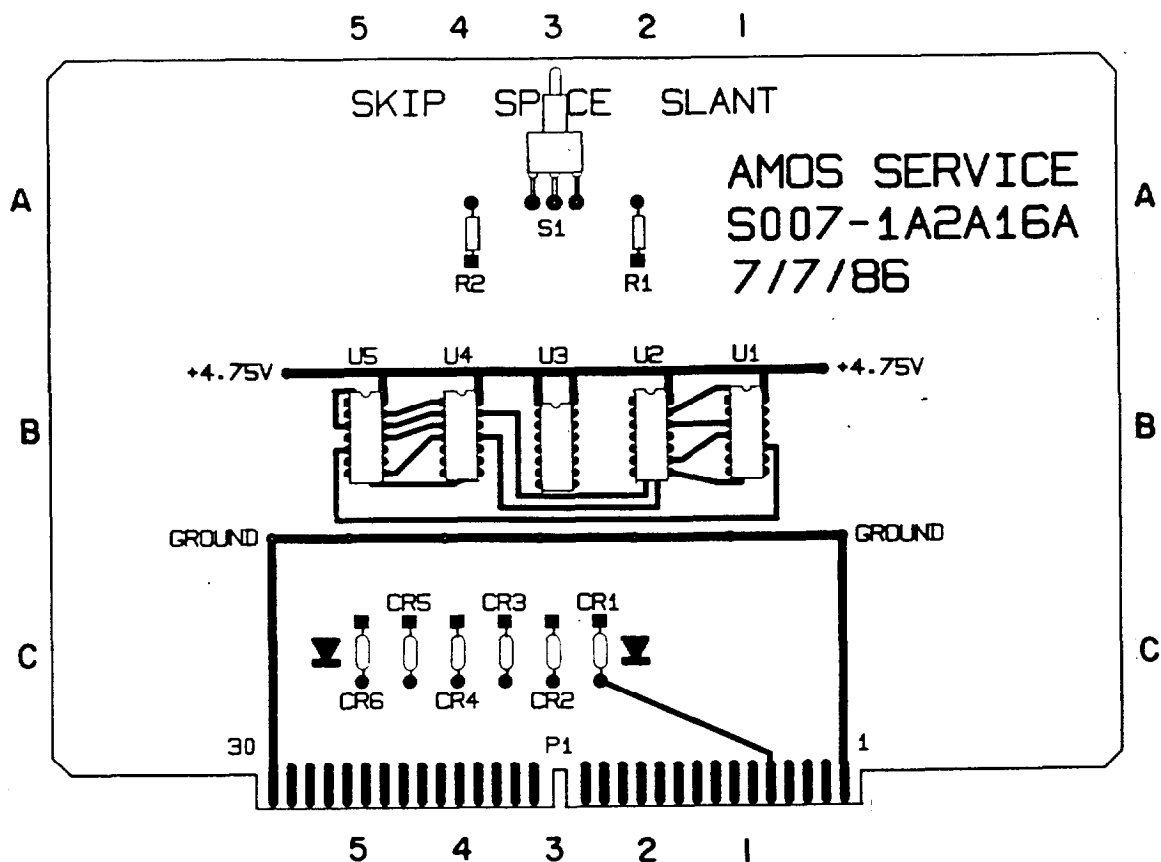
Sets up format and controls output signal from the Baudot Coder. Gate U2-B causes the Shift Register to shift on the trailing edge of the SHIFT pulse. When RESET is high, the shift register will be reset (All Q outputs low). When the 1 IN input goes high, the LETTERS output of U3-A will be set high. The next high SHIFT pulse will toggle LETTERS low, which in turn toggles U3-A M output high. Succeeding SHIFT pulses will step these highs to FIGURES and 4TH CHARACTER.

③ MANUAL INPUT

Permits manual selection of SLANT, SPACE, or SKIP as teletype output. It also determines whether the 1 OUT output is produced with the third character (FIGURES) or the fourth character (SPACE or SLANT). When S1 is in SPACE position, gate U2-D will be enabled, causing the Baudot Coder to produce the 1 OUT output and a baudot code for space (M3 only). When S1 is in the SLANT position, gates U1-C and U2-D will be enabled, causing the Baudot Coder to produce the 1 OUT output and a baudot code for slant (M1, M3, M4, M5). When S1 is in the SKIP position, gate U2-C will be enabled, causing the 1 OUT output to be produced with the FIGURES character.

④ BAUDOT CODER

Codes the inputs from the Shift Register and Manual Input to a Baudot output.



1A2A16A SERVICE.

REF DESIG.	LOCATING COORD.	NAME AND DESCRIPTION
CR1	C/3	DIODE, 1N914
CR2	C/3	DIODE, 1N914
CR3	C/4	DIODE, 1N914
CR4	C/4	DIODE, 1N914
CR5	C/5	DIODE, 1N914
CR6	C/5	DIODE, 1N914
R1	A/2	RESISTOR, 100K OHM, 5%, 1/4 WATT
R2	A/4	RESISTOR, 100K OHM, 5%, 1/4 WATT
S1	A/3	SWITCH, TOGGLE, SPDT CENTER OFF, C&K 7103
U1	B/1	QUAD 2-INPUT NOR GATE, RCA CD4001BE
U2	B/2	QUAD 2-INPUT NOR GATE, RCA CD4001BE
U3	B/3	DUAL 4-STAGE SHIFT REGISTER, RCA CD4015BE
U4	B/4	TRIPLE 3-INPUT OR GATE, RCA CD4075BE
U5	B/5	TRIPLE 3-INPUT OR GATE, RCA CD4075BE

AMOS MODIFICATION NOTE 13
(for Electronics Technicians)

SUBJECT : Replacement Modules S007-1A2A8A (Temperature)
and S007-1A2A9A (Dew Point)

PURPOSE : To notify the electronics technician of the
availability of a replacement for the S007-1A2A8 and
S007-1A2A9 modules and advise that Change 14 to the
AMOS manual is now available.

EQUIPMENT AFFECTED : All S007 systems (AMOS and AUTOB)

PARTS REQUIRED : Change 14 to AMOS Manual 11-103 will be available
through NLSC.

MOD PROCUREMENT : Parts will be available through normal NLSC stock.
These replacement modules should be ordered only as
required.

SPECIAL TOOLS : None
REQUIRED

TEST EQUIPMENT : None
REQUIRED

TIME REQUIRED : 1 work hour

General

The AMOS Temperature Module (S007-1A2A8) and Dew Point Module (S007-1A2A9) are no longer manufacturable because of obsolete components; however, support and repair for the old modules will continue until spare parts run out. Engineering Design Branch, W/OS031, has redesigned the modules using CMOS circuitry. The replacements are functionally identical to the existing modules and will be stocked with those modules under the existing stock numbers.

Procedure

1. It is not necessary to order a module to comply with this modification: a replacement board should not be ordered unless a failure has occurred.

The only action necessary is to order copies of Change 14 for the AMOS manual from NLSC, if needed.

2. The following pages should be inserted into the AMOS manual:
2-35A, B and 2-134A, B, C, D, E, F, G and H.

J. Michael St. Clair 
Chief, Engineering Division

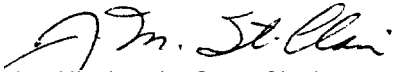
AMOS Change Number Revision

1. Summary:

This errata sheet is to notify the electronics technician that all references in Modification Note 13 to "Change 14" in the AMOS manual should be deleted and replaced with "Change 16."

2. Effect on Other Instructions:

When inserts are received, delete all references to "Change 14" and replace with "Change 16."



J. Michael St. Clair
Chief, Engineering Division